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Meet At Middletown to Form New TAPPI Section

Organization Committee Is Nominated and Will Serve as Provisional Executive Body Until the Next Meeting When Officers Will Be Elected—R. G. Macdonald, National Secretary-Treasurer, Outlines Purpose of the Organization—Southern Ohio Section Will Be Sixth Section of the Technical Association

MIDDLETOWN, Ohio, November 26, 1934—Preparatory to the formation of a Section of the Technical Association of the Pulp and Paper Industry in Southern Ohio about sixty members and friends of the association met at the Manchester Hotel, Middletown, Ohio on Tuesday evening, November 20. H. H. Latimer, general superintendent of the Beckett Paper Company, Hamilton, Ohio presided as temporary chairman.

Following an excellent dinner the chairman appointed a special committee consisting of L. C. Currier of the Sorg Paper Company, Middletown; Vincent F. Waters of the Wrenn Paper Company, Middletown; and George F. Hermann of the Hermann Manufacturing Company, Lancaster, Ohio; to nominate an organization committee to serve as the provisional executive body until the next meeting when officers will be elected.

Organization Committee Selected

The committee which was proposed and elected was as follows: Joseph H. Wallace, Black-Clawson Company, Hamilton, Chairman; George H. Harvey, Gardner-Richardson Company, Middletown; E. C. Hendrickson, Mead Corporation, Chillicothe; O. P. Gephart, Oxford Miami Paper Company, W. Carrollton; R. B. Roe, Sorg Paper Company; C. D. Roess, Wrenn Paper Company; and J. F. Ohlson, Oxford Miami Paper Company.

George H. Harvey, production manager of the Gardner-Richardson Company and one of the first members of TAPPI in the Miami Valley was called upon to speak and in a few well chosen words welcomed the organization of a TAPPI Section, pointing out that nearly all of the important improvements have been made in pulp and paper manufacture in the past twenty-five years have been due to the efforts of technical men, most of whom are members of the Technical Association.

R. G. Macdonald, National Secretary, Speaks

R. G. Macdonald, national secretary-treasurer of TAPPI was the next speaker. Mr. Macdonald pointed out that he was "pinch-hitting" for Clark Heritage, president of the association, who is in Europe and had planned to be present. He stated that a new section in the Miami Valley will be the sixth, there being sections located in the Pacific Northwest, Lake States, Kalamazoo Valley, New England and in the Delaware Valley.

The secretary outlined the various activities of the association—its divisions, publications, manual of standards, and services to members. The plans for the annual meeting in New York on February 18 to 21, 1935 were described.

D. E. Lewellen Speaks on Speed Control

D. E. Lewellen, President of the Lewellen Manufacturing Company, Columbus, Ind., described the various speed control devices made by his company. These included the Harvey-Lewellen drive for board mills; the Lewellen jordan control by means of a uniform load on a motor directly connected to a jordan; the cylinder vat control whereby the liquid levels inside and outside the cylinders is kept constant; and automatic screen flushing controls. Mr. Lewellen emphasized that these controls are not intended to replace men but to serve as a tool with which they may do better work.

H. G. Specht Speaks on Wires

H. G. Specht, vice president of the Eastwood-Nealley Corporation, Belleville, N. J. discussed "The Manufacture and Use of Fourdrinier Wires." This talk was excellently illustrated with slides. Mr. Specht pointed out that there are 1,000 paper machines in the United States, on which every wire is custom-built. Among these machines is a wide divergence of lengths and widths of wires and the duties to be performed by them.

The various wire seams were shown and a large number of accident effects were illustrated. The best ways of repairing wires were described. Mr. Specht advocated that the Technical Association establish a standard means of expressing wire life in foot-days to avoid the term "days run." There is also a need for a method of measuring the running tension of wires.

The causes for short wire life were indicated. These related to the load on the wire apron, the method of oscillating suction boxes, the design of suction box covers, angle of wire with the stretch roll, location of showers and doctor blades, etc.

(Continued on page 39)

Outlook for Newsprint Paper Industry Brighter

Lead Given by International Paper Co., Followed by Other Companies Almost Unanimously—St. Lawrence Paper Co. Reported to be Negotiating With Two Big Newspaper Publishers to Obtain Revision of Its Commitments for Forthcoming Year

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 26, 1934—While the situation in the newsprint industry here certainly looks much brighter than for a long time past, it is still beclouded by uncertainty over the outcome as affecting the St. Lawrence Paper Company. Statements by executives of other newsprint companies show that they are almost unanimous in following the lead given by the International Paper Company in announcing an increase of $2.50 per ton for the first half of 1935 and another $2.50 per ton for the second half of the year. It is to be noted, however, that one Canadian producer in the East, one in British Columbia, and one United States producer qualify their support of the price increase with a statement that certain customers, by the terms of their contracts, must receive special consideration.

Companies Which Have Made Announcements

Leading companies which have publicly announced adherence to the International Paper Company's new scheduled prices include the following: Price Bros. & Co., Consolidated Paper, Abitibi Power and Paper, J. R. Booth Company, Powell River Company, Donnacona Paper, Great Lakes Paper, Lake St. John Paper, E. B. Eddy Company, Jas. Maclaren Company and Mersey Paper Company.

In their statements, and in interviews to the press, leading executives are unanimous in maintaining that a higher price on newsprint is badly needed and the general opinion expressed was that the price increases initiated by International were fully justified by conditions and moderate in extent when the rise in costs that has taken place in the industry is considered.

So far as St. Lawrence Paper Company is concerned no public statement has been made, but papers here say that the company is understood to have been carrying on negotiations with the Hearst and Scripps-Howard interests in an effort to obtain a revision of its commitment for newsprint supplies to the two big publishers next year at 1934 prices. So far, it is indicated, there have been no signs of any success along these lines being achieved, and, in view of the unrelenting attitude of both of these powerful publishers when the newsprint interests were attempting to obtain a better price for their produce by agreement, it is to be assumed that they will not recede from their position without putting up a fight.

Press opinion seems to be that the efficacy of the price increase announced by the other mills may depend upon whether or not St. Lawrence can fulfill its commitments against the opposition of the Quebec Government, which has threatened reprisals in the form of withdrawal of concessions to the company in its woods operations. In this connection it is reported that St. Lawrence has sufficient wood on hand to take care of the 1935 operations, and that, therefore, the Quebec Government's action would not affect its costs. It is also stated that banking arrangements have been assured which will provide the company with the working capital necessary for fulfillment of its 1935 contracts.

Summing up, the opinion seems to be that there is still a danger that the Federal Government may have to be called upon to bring the industry under the Marketing Act in order that the revised prices for next year may be maintained.

Position of the Powell River Company

A Vancouver despatch shows that adherence of the Powell River Company, premier newsprint mill on the Pacific Coast, to the new price schedule is qualified. It appears that the only contracts entered into for 1935 at the old $40 base price were in the Southeastern States, where the company has developed an important market.

A. E. McMaster, vice-president and general manager of the Powell River Company and leading figure in price negotiations in progress on the Pacific Coast recently, stated that the coast mills would in all probability adopt a price schedule similar to that already announced by International Paper Company.

In recent years the coast mills have been pretty much of a law unto themselves in the matter of price, although the threat of competition has forced them to keep within striking distance of the prices charged by eastern mills. However, the position of the eastern mills cannot be compared with that of the coast mills. Costs of production have advanced there, but probably not to the same extent as in the east. The coast mills have been operating at 100 per cent capacity for many months, as compared with an average of around 70 per cent in the east, and they have the advantage of tidewater location, making them easily accessible to the export markets reached by deep sea shipping. Power costs and stumpage costs have been comparatively low too.

While the coast mills will welcome a price increase and even with the new price will not be making much of a margin for profit, they are not in the same desperate need for it as the eastern mills.

An important factor in determining prices on this coast has been competition of Scandinavian and Newfoundland mills.

Canadian Newspapers Issue Statement

Meanwhile W. J. Butler, president of the Canadian Daily Newspaper Association, has issued the following statement on the proposed advance in the price of newsprint:

"The day of the two-cent daily newspaper appears doomed.

"Only the low prevailing price of newsprint and the most efficient management has enabled the publisher to continue for the past few years the production of our daily newspapers at present prices.

"Cumulative taxes have been levied by the Government, and today the publisher is paying what is considered to be an unfair tax of six per cent on newsprint an increase in postal rates and a surcharge in postal rates on excess advertising content before profits (if any) are reached, when a further corporation tax of 12½ per cent has to be met.

"The profit tax is not combated, but the sales tax on newsprint is felt to be unjust because no method has been devised to pass this on to the consumer, and consequently a direct tax to the publisher is the result.

"Some of the Canadian publishers recognize that newsprint has been priced almost unprofitably to the mills during the past two years, just as in 1921 to 1928 they were abnormally high, reaching prices that were entirely unreasonable. The publishers know that the second largest Canadian industry cannot be operated in perpetual bankruptcy, but we will, of course, vigorously combat a cumulative campaign involving persistent annual or semi-annual increases in newsprint prices that are unwarranted.

"There is no question that publishers are being asked by our Governments to meet taxes beyond their power to pay, for, in addition to a Dominion tax, we pay a further provincial corporation tax in Ontario.

"The publishers of Canada will, of necessity, require governmental consideration, and immediate steps will be taken to conserve the publisher interests, which are so important to the future welfare of Canada."

Newsprint Exports Still Increasing

A report just issued by the Dominion Bureau of Statistics shows that the value of exports of newsprint from Canada in October was higher than in the previous month and considerably higher than in the same month last year.

The total for October was $6,958,945 as compared to $6,569,041 in September and $6,285,008 in October, 1933.

The value last month did not keep pace with the increased volume of exports on the year's comparison. Tonnage exported in October was 204,904 tons as compared to 171,947 tons in October, 1933, or an increase in volume of 19.1 per cent. The value, however, rose only 10.7 per cent.

Out of the total value of $6,958,945 for last month's newsprint exports the shipments to the United States amounted to $5,727,969.

For the seven months of the Dominion's fiscal year—that is, April to October, inclusive—the value of exports of newsprint from Canada was $46,942,590 as compared to $42,064,446 in the corresponding period of last year.

Comparative newsprint export figures follow:

	Volume (Tons)	Value
October, 1934	204,904	$6,958,945
September, 1934	190,794	6,569,041
October, 1933	171,947	6,285,008
7 mos., 1934	1,373,752	46,942,590
7 mos., 1933	1,116,950	42,064,446

Government Paper Bids

[FROM OUR SPECIAL CORRESPONDENT]

WASHINGTON, D. C., November 28, 1934—The Government Printing Office has received the following bids for 1,224,000 pounds of newsprint paper: National Pulp and Paper Company, Inc., 2.15 cents and 2.0025 cents per pound; Reese & Reese, Inc., 2.055 cents; R. P. Andrews Paper Company, 2.055 cents and 2.182 cents; Old Dominion Paper Company, 2.025 cents and 2.055 cents; and Perkins-Goodwin Company, 2.025 cents and 2.055 cents.

For 2,000 sheets of Quaker drab cloth lined cover paper: Reese & Reese, Inc., $16.10 per C sheets; Barton Duer & Koch Paper Company, $15.75; Whitaker Paper Company, $15.55; and R. P. Andrews Paper Company, $15.80.

Now Spray Engineering Co.

In order to avoid confusion, Spray, Inc., engineers—manufacturers of 114 Central street, Somerville, Mass., has changed its name to the Spray Engineering Company which was the former style of the firm. This change is in name only and in no way affects the charter, personnel or business policy of the company.

Gair Old Timers Meet

Past and former members of the Robert Gair Company, Inc., organization held the second annual dinner of the "Gair Old Timers" at the Hotel New Yorker recently. The event brought together more than 165 men who are now in the organization or who have served for varying periods in the past, including some who began with the Company as far back as the 1870s. In addition to those who came from all sections of the East and Middle-West to attend the dinner, there were messages from as far off as San Francisco from those who were unable to be present.

The function was purely social, speeches banned and the only business before the gathering was the election of officers for the ensuing year. Those elected were P. F. Gaffney of the Densen Banner Company, president; A. B. Crowell of the Robert Gair Company, Inc., vice-president; and H. B. VanAntwerp of Sinclair & Valentine, secretary-treasurer. The retiring officers are Charles F. Stocker of Grinnell Lithographic Company who served as the first president; D. B. Hassinger of Hassinger Art Service who was vice-president and Francis Smith of the Robert Gair Company, Inc., who was secretary-treasurer.

Among those who attended were P. L. Andrews of P. L. Andrews & Co., N. Y.; John Boyce, Robert Gair Company, N. Y.; J. H. Cashman, Pepperell Paper Company, East Pepperell, Mass.; F. Collins, Eastern States Corrugated Company, Brooklyn, N. Y.; H. Costigan, Brown & Bailey Company, Philadelphia, Pa.; Elmer Curtiss, Gair Company, N. Y.; James J. Daly, Bogota Paper and Board Corporation, Bogota, N. J.; James Davis, Webb, Jensen & Davis, Brooklyn, N. Y.; A. Doll, F. M. Sayford Company, Brooklyn, N. Y.; W. W. Fitzhugh, W. W. Fitzhugh, Inc., Brooklyn, N. Y.; L. H. Gaetz, Eastern States Carton Corporation, Brooklyn, N. Y.; F. Gaus, Folding Carton Company, Maspeth, L. I.; William Glennon, N. Y.; Robert Hogan, National Folding Box Company, New Haven, Conn.; W. F. Howell, Gair Company, N. Y.; H. Hughes, Pulp and Paper Trading Company, N. Y.; Charles Korte, Haller & Munro, N. Y.; Paul Lang, Continental Folding Box Company, Brooklyn, N. Y.; Harry McPhilliamy, Gair Company, N. Y.; David Nogle, General Carton Company, Brooklyn, N. Y.; Henry W. Pupke, Teaneck, N. J.; Leslie Rich, Gardner-Richardson Company, N. Y.; E. E. Seaver, Gair Company, Philadelphia, Pa.; E. O. Sommer, Gair Company, N. Y.; Fred Stocker, Atlantic Gummed Paper Corp., Brooklyn, N. Y.; F. Wasgatt, Gair Company, New York, and E. Victor Donaldson, president, Robert Gair Company, Inc., New York.

Paper Future at Bonneville Studied

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., November 21, 1934—The co-operative group of engineers, business men, faculty members and students studying the Bonneville project, under the auspices of Reed College, held its second meeting last week at Reed College. The meeting, attended by some 35 members of the group, was directed to a search for the facts relating to the development of the paper and pulp industry, and how it would be affected by the Bonneville dam.

The general consensus was that the price of power would not be a controlling factor in the development of the paper and pulp industry here, though the availability of a steady supply of power might prove influential in the development of the industry in the area supplied by Bonneville power.

The discussion was led by L. T. Merwin of the Northwestern Electric Company; John Lewis, consulting engineer, and W. D. B. Dodson of the Portland Chamber of Commerce. President Dexter M. Keezer presided at the meeting.

U. S. Forest Products Laboratory Expanding

Chip Hoist, Six Stories High, Installed Recently In Vast New Laboratory Building—New Method of Pulping Being Worked Out That Should Prove of Great Benefit to Paper Industry—Different System of Handling Chemicals to be Adopted

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 26, 1934—Addition of equipment and enlargement of research are in progress at the United States Forest Products Laboratory at Madison, Wis., in the hope of stimulating national pulp production and restoring prosperity to the industry.

One of the important installations in the vast new laboratory building completed recently is a chip hoist six stories high. It will replace a small hoist, and will give the laboratory a regular commercial hoist by which wood chips can be handled in tons instead of pounds in order to make experimentation more effective.

A new method of pulping is being worked out that is expected to prove of great benefit to the industry. It is an adaptation of the present day kraft process. A different method of handling chemicals will be adopted, resulting in greater economy of production.

Much of the expansion program is made possible through grants of federal relief funds. The total thus far appropriated is $135,000, a portion of which has been used to employ more men trained along scientific lines and the promotion of research along more extensive lines. Additional clerks, stenographers and laborers have also been given employment in this enlarged program.

The laboratory is responding to what is considered a national need for better, less wasteful utilization of pulp resources. New and up-to-date equipment will enable the staff to carry on research on a commercial scale. Old laboratory equipment was diminutive and unsatisfactory because its results could not be applied with a certainty to industrial plants.

With United States mills importing a greater proportion of their pulp supply each year, domestic manufacturers have been pressed into competition that has grown increasingly unfavorable to them as our own superior supplies of pulpwood dwindle, the laboratory finds. The steady falling off of national production has resulted in increased unemployment. Any stimulation therefore is regarded as a deciding factor in restoring prosperity to the industry. It is estimated by laboratory officials that approximately 70,000 jobs would be provided in the pulp industry alone if this country could be made self-sufficient in pulp production. New methods therefore are sought whereby woods now regarded as unsuitable can be used for pulps.

State Unemployment Insurance

Paper mills in Wisconsin have been heavy contributors to the unemployment reserve fund being accumulated under the state unemployment insurance act. The report of Paul Rushenbush, administrator, show that $470,000 was paid in during July, August and September. The contributions represent two per cent of average payrolls. Approximately 3,400 employers were subject to the act when it went into effect July 1, 1934. Benefits will not become generally payable under the law until after July 1, 1935, based on employment and unemployment after that date. A full year of contributions is allowed, as a general rule, before an employer's liability starts.

Seventy employers of 3,000 workers have elected to be exempt from the law's standard provisions by establishing guaranteed employment plans which are now in full operation and assure these workers of at least 42 weeks out of the year in work and wages.

Another 1,200 employers are depositing their reserve funds in special bank accounts, under supervision of the Wisconsin Industrial Commission. These accounts are subject to federal deposit insurance protection. Another 1,000 are depositing their reserve funds with the industrial commission and the state treasurer. These are being invested in United States treasury notes. About 400 employers of exceptional financial strength have been permitted to set up unemployment reserve accounts on their books, subject to such security as the industrial commission may require from time to time. All contributions are payable by employers and cannot be deducted from wages of the employees.

News of the Industry

Approximately 100 bundles of wood pulp were consumed in a fire last week at the Marinette and Menominee Paper Company plant at Marinette, Wis. The fire is believed to have been started by sparks from a locomotive. A crane was pressed into service to remove the burning bundles so the fire could not spread. The exact amount of the loss could not be determined until the salvage had been estimated.

One of the last cargoes of pulp to reach Wisconsin was unloaded at the docks at Manitowoc, Wis. It was brought aboard the Norwegian freighter *Nesttun* from Baltiski, Estonia, on the Gulf of Finland. The pulp was consigned to paper mills of the Fox River Valley.

Dr. John A. Wilson, consulting chemist, of Milwaukee, Wis., was the speaker at the monthly meeting last week at Appleton, Wis., of the Northeastern Wisconsin section of the American Chemical Society. The meeting was held at the Institute of Paper Chemistry. Dr. Wilson spoke on tanning processes.

Frank P. Vaughan, treasurer of the Bay West Paper Company, Green Bay, Wis., was elected president of the Wisconsin State Chamber of Commerce at its annual meeting at Madison, Wis., last week. He succeeds John L. Barchard, president of Hummel & Downing Company, Milwaukee, who held the office four terms. E. A. Oberweiser, president of Whiting Plover Paper Company, Stevens Point, Wis., and A. B. Hansen, manager of the Marinette and Menominee Paper Company, Marinette, Wis., were elected to the board of directors.

A logging crew of the Consolidated Water Power and Paper Company cutting hemlock near Crandon, Wis., gathered some statistics as to the number of hunter's bullets that go astray. They counted 83 rifle slugs in a month's cut, ranging from 22-calibre to army size bullets.

Sutherland Declares Extra Dividend

The Sutherland Paper Company, Kalamazoo, Mich., has declared an extra dividend of 10 cents and the regular bi-monthly dividend of 10 cents a share on the common stock, both payable on Dec. 20 to stock of record of Dec. 10.

Demand for Paper Is Fairly Active In Boston

Both Fine and Coarse Paper Standard Grades Moving In Moderate Volume—Outlook for Last Weeks of Year Considered Bright—Box Board Market Rather Quiet, Although Prices Continue Firm—Paper Stock Remains Generally Listless

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 26, 1934—Paper merchants here, as a whole, transacted a fair amount of business during the last week, in both fine and wrapping lines. The market, as usual during the last week or so of a month, was somewhat less active in general. With some, it was spotty. The complaint of chiselling persists. The paper bag situation is specially mentioned in this connection. It was intimated at the office of one of the largest jobbing houses, which handles wrapping paper, that in this line there is a little more optimism on the part of purchasing agents and paper distributors and that it looks like a good spurt of business for the last weeks of the year.

In box board, hardly better than a moderate volume of orders was received, but values continued firm.

Paper stock was generally very dull. In a few isolated cases, however, such as khaki cuttings and O. D. khaki, there was a fairly substantial movement, to such a degree that prices advanced. Khaki cuttings went up to .03¼ @ .03½ from a former quotation of .03 @ .03¼ and O. D. khaki to .03 @ .03¼ from .02¾ @ .03. Other grades of new domestic rags as well as old domestic rags, foreign rags, bagging and old papers remained at the same levels.

News of the Trade

William N. Stetson, Jr., the new president of the New England Paper Merchants Association, is making definite preparations for an active season. He has already perfected plans for bi-weekly luncheon meetings of the Fine Paper Division.

Winthrop L. Carter, of Newton, Mass., widely known in the paper trade, was elected president of the New England Council at an executive meeting on Thursday during the Tenth New England Conference of that body November 22 and 23 at the Hotel Statler. Mr. Carter, who is president of the Nashua Gummed and Coated Paper Company, Nashua, N. H., and vice president of Carter Rice & Co., Corp., and is actively identified with other business enterprises, presided over one of the group sessions as chairman of the industrial committee, on Friday, when "New England Industry: Its Adjustment to Changing Conditions" was considered.

The office of Stone & Forsyth Company is gaily decorated for the Christmas season. Beneath festoons of red and green paper ribbon and small pictured boxes are counters containing fancy papers and twine in Yuletide colors, besides cords in gold and other colors, with an abundance of Christmas dressings.

At the office of the Brown Company, favorable statements are made in regard to business. Solka is moving well, with distributors receiving orders for Solka kraft in substantial volume.

William F. Snyder and Walter B. Cary have become associated with the Kendall Paper Company, Cambridge, Mass. They were formerly with the Andrews Paper Company, as were the president, Lewis C. Bills, and James R. Livingstone, two of the incorporators of the new company.

Thomas K. Bradford, representing the Wheeler Paper Corporation of Albany, N. Y., is handling a new product of that company, Dryettes Paper Towels, in a self-contained dispenser, a novel and attractive handy box, carrying 75 single fold towels. Dryettes will be sold through gasoline stations and automobile sales offices for the use of car owners for wiping hands and windshields. They will also be found in gift shops. The retail price is 15 cents a box.

A sales meeting was held at the office of Storrs & Bement Saturday morning, when trade customs were discussed. John H. Brewer, general manager of the company, presided.

N. F. Davis, secretary of the Davis Paper Company, West Hopkinton, N. H., who is well known in the Boston trade, has returned from a hunting trip in the northern portion of that state, with a party of ten. A snowfall on the ground rendered conditions favorable for hunting so that the group bagged seven deer.

Paul M. Beach, of the Riegel Paper Corporation, of Milford and Riegelsville, N. J., with main offices at New York; George S. Gordon, of Smith Paper Incorporated, Lee, Mass., and E. T. Simpson, of the Eastern Manufacturing Company, Bangor and Lincoln, Me., with main offices in New York, called on the trade last week.

A daughter was recently born to Mr. and Mrs. M. L. Simpson. Mr. Simpson is a salesman on the staff of Knight, Allen & Clark, Inc.

New Guillotine-Type Paper Cutter

Announcement of the new Allsafe Control for guillotine-type paper cutters giving two handed protection for one or more operators per machine, is just being made by the American Allsafe Company. This Allsafe Control has been approved by the New York State Department of Labor, Approval Number 3010.

The Allsafe Control is so arranged that both hands of every operator must be on the control buttons before the knife can begin the downward stroke. If any operator removes either hand from the controls, the clutch is instantly thrown out and the automatic brake stops the knife "in its tracks".

After the knife completes the cutting stroke, it returns to the top position automatically, thus leaving the operator's hands free to prepare for the next batch. Special provision is made for jogging the knife bar up or down while "setting up" a new blade.

In addition to providing maximum safety, the Allsafe Control provides easier operation through the use of the General Electric Trustor which eliminates the fatigue resulting from the manual labor of constantly throwing in the heavy clutch.

The interlocking controls make it impossible for the cutter to "repeat". Furthermore, a second cut can not be made until all hands are on the control buttons and out of harms' way.

The company has issued an interesting bulletin entitled "How to Provide Maximum Protection for Your Men and Your Profits With the New Allsafe Control for Paper Cutters," which may be had free on application.

Abitibi to Operate Newsprint Mill At Capacity

After Curtailing Production Since September, 1931, Iroquois Falls Plant Will Work on Full Schedule Immediately—Sixth Machine Started Last Saturday and Seventh Now Placed In Commission—Increased Tonnage Demand Attributed to Higher Prices

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 26, 1934—The Iroquois mill of the Abitibi Power and Paper Company, which has been on curtailed production since September, 1931, will operate at capacity immediately, it was announced in Iroquois Falls this week. The mill is capable of producing 600 tons of newsprint daily. The increase in tonnage requirements is attributed by mill officials to the reported increase in newsprint prices. A sixth machine was started at the mill last Saturday and a seventh has now been placed in commission. It could not be determined how many men would receive employment from the increased work. It was stated that many employees would return from a six to an eight-hour working day.

Pulpwood Operations Broader

According to records made by the *Canada Lumberman*, Toronto, pulpwood operations in Canada timber reserves during 1934-35 season will be somewhat greater than a year ago. According to the paper's survey the Port Arthur Division of Provincial Paper, Ltd., plans on cutting from forty to forty-two thousand cords of pulpwood. In addition the company is purchasing 20,000 cords in the open market. Pacific Mills, Ltd., at Ocean Falls, B. C., plans to log approximately 85,000,000, of which 40 per cent is purchased and the balance is logged by contractors. This delivery represents an increase of 12 per cent over last year's operations. Lake St. John Power and Paper Company, in Quebec province, plans to deliver at their mill next spring 77,500 cords, which is somewhat less than last year. Ontario Paper Company will cut about 140,000 cords. In addition the company plans to purchase 25,000 to 30,000 cords from the outside market for delivery during the summer of 1935. Powell River Company, British Columbia, plans on purchasing 140,000,000 feet of logs, or sufficient to run the plant at capacity. Alliance Paper Mills, at Merritton, Ont., are not operating their limits in Gaspe but plan to purchase a small amount from Shawbridge, while Bathurst Power and Paper Company, Bathurst, N. B., will take out approximately 50,000 cords in their limits this season. This is nearly double the amount taken out last season. E. B. Eddy Company, Hull, Que., plan on taking out approximately the same amount of pulpwood on their limits this year at last. Anglo-Canadian Pulp and Paper Mills, of Quebec, report that they cut their wood during the summer months and have completed this phase of the work. They took out approximately 200,000 cords, or somewhat more than their usual cut. Donnacona Paper Company, in Quebec, plan on cutting and purchasing about 84,000 cords this season, which is over double the amount taken out last season, while Manitoba Paper Company, at Pine Falls, Man., will require about 50,000 cords this season, compared with around 20,000 cords in 1933-1934.

Notes and Jottings of the Trade

Walter Woodward, of Fort Frances, Ont., has entered the camp inspection service of the Provincial Government and will be a member of the conciliation board between operators and the men in the bush. Mr. Woodward has had abundant experience as a labor man and on several occasions has represented the Pulp and Paper Makers' Union in their negotiations with various companies. He has been a member of the Council of Fort Frances and is a former mayor of the town.

Henning J. K. Arbo, chief chemist of the Woodfibre plant of the British Columbia Pulp and Paper Company, died recently at his home in British Columbia. He came to Canada from Norway in 1898, and for a number of years was associated with the Partington Pulp and Paper Company, at Fairville, N. B., and the Fraser Companies, at Edmunsdon. In 1918 Mr. Arbo moved to Woodfibre. He was a prominent figure in the technical field of the British Columbia pulp and paper industry and is survived by his wife and two sons.

A. Johnson, superintendent of the sulphite mill of Provincial Paper Ltd., Port Arthur, Ont., gave an interesting address before the Rotary Club in that city, outlining a trip to Portland, Ore., where he visited several sulphite mills. Professor G. C. Cosens, of the staff of the Faculty of Forestry, University of Toronto, states that Canada can only remain on top of the pulpwood market as long as it is able to market good newsprint at a price lower than the rest of the world. He urged, in an address, that Canada should look to the future and pointed out that while in the northern country there are many timber stands, a number of them were not available owing to being too far from the mills, or the cost of transportation was too great. He explained that Canada had many advantages over other pulpwood producing countries because of its cheaper electric power and transportation.

Dr. C. D. Howe, Dean of the Faculty of Forestry at the University of Toronto, observed in an address recently that Canada had pulpwood to last for at least 100 years. This assertion was based on the present rate of cutting, which in Ontario was in the neighborhood of one million cords annually. Each year there were about 500,000 cubic feet of timber wiped out by fire. The four daily papers of Toronto used such a quantity of paper that it required 15,000 cords of wood yearly to supply the raw material for the product.

Bagley & Sewall Co. Elects Officers

WATERTOWN, N. Y., November 26, 1934—A meeting of the directors of the Bagley & Sewall Company was held here last week at which several vacancies in the board were filled. Clarence E. Kinne, who severed connection with the company in the spring of 1933, was chosen vice president and a director to succeed Allan M. Perkins, resigned. Mr. Kinne is recognized as among the best engineers in the country and was with the company for many years previous to his recent retirement. Other new directors chosen by the company include Jean R. Stebbins and A. T. Ten Eyck, both prominent business men here. They take the places made vacant by the recent resignations of Raymond G. Hannahs and Harold W. Conde. The officers of the company now include Charles W. Valentine, president; E. S. Lansing and C. E. Kinne, vice presidents; C. L. Thompson, treasurer, and Harry C. Kinne, secretary.

Chicago Paper Market Sentiment Improving

Advance In Newsprint Quotations for Forthcoming Year Proves Bullish Factor—Various Standard Grades of Fine Paper Steady, With Books and Ledgers Moving In Fairly Good Volume—Noticeable Betterment Experienced In Coarse Paper Section

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 26, 1934—Much improved sentiment was evidenced in the Chicago area with the announcement of the general $2.50 a ton advance in newsprint for the first six months of 1935 and with the expectations that the increase would be moved up to $5.00 a ton during the final six months. Chicago newsprint representatives expressed disappointment that the price was raised no higher but seemed obviously content with the old adage that "half a loaf is better than none." The coarse paper situation in Chicago also improved rather noticeably during the past week, both marketwise and in relation to a continued building up of the market.

Generally speaking, no lines reported any appreciable increase in volume during the fore part of the month although, as stated above, there are evidences of more stability and more requests for specifications. The Salesmen's Association is hoping for a clarification of contract relation specifications emanating from the P.I.A. and coming prior to December 1.

Fine papers remained about the same during the week, with bonds and ledgers in fair demand. Books and covers showed a slightly stronger tendency, as did kraft and specialties, which were reported as "a bit better than fair." The ground wood market was somewhat buoyed up following the announcement relative to newsprint. Waste paper executives are awaiting with interest the court decision on the injunction proceedings brought against the majority of them by a local waste paper house and expected to be settled early in December. Marketwise, waste papers were reported dull.

Paper Exhibits Attract

Despite inclement weather nearly 6000 interested onlookers visited the Chicago version of the traveling D.M.A.A. exhibit held at the Stevens Hotel, November 20, 21, 22 and 23. It was more of an actual paper exhibit than ever before, the exhibition hall being replete with the papers of various mills widely used in direct mail advertising. The four major displays including how 27 industries made use of direct mail advertising; the fifty direct mail leaders in 1934; the large number of local exhibits and the educational exhibits, were all well patronized. Norman Ventriss, of the Munising Paper Company, chairman of the exhibit for its Chicago stay, did an excellent job of inciting local interest assisted by a group which met on November 12, under the chairmanship of James Abel, of Butlers, to arrange cooperative efforts with the printers for a full enjoyment of the exhibits.

Included among the "local" exhibits (not a part of the traveling exhibits) were those of the Beckett Paper Company and the panels of the Chicago Ad Club and the local D.M.A.A. organization. The national exhibitors tied up effectually with local distributors in a practical way and about as follows: Dill & Collins, Messinger Paper Company, James White Paper Company; Crocker-McElwain-Berkshire Paper Company, Chicago Paper Company, Dwight Paper Company, Empire Paper Company, La-Salle Paper Company; Messinger Paper Company; Midland Paper Company, Moser Paper Company, Murnane Paper Company, Parker, Thomas & Tucker, Bradner Smith & Co., Swigert Paper Company, Tattershall Paper Company and James White Paper Company; International Paper Company, Bermingham & Prosser, J. W. Butler Paper Company and Messinger Paper Company; Linweave Association, Chicago Paper Company and Swigert Paper Company; Howard Paper Company, Midland Paper Company, Moser Paper Company, Parker, Thomas & Tucker; Rising Paper Company, Messinger Paper Company, Midland Paper Company and Parker, Thomas & Tucker; Gilbert Paper Company, Berkshire Paper Company, Chicago Paper Company, Dwight Bros. Paper Company, Empire Paper Company, Moser Paper Company, Bradner Smith & Company, Swigart Paper Company and W. E. Wroe & Co.; Eastern Manufacturing Company, La Salle Paper Company and Dwight Paper Company; Appleton Coated, Dwight, Moser, Whitaker Paper Company and James White; Falulah, Moser and Bradner Smith; Whiting Plover, Midland, Moser and Swigart; S. D. Warren, Chicago Paper Company; Oxford Paper Company, Bermingham & Prosser and Bradner Smith & Co.; Nenah Paper Company, Blunden-Lyon, Marquette, Midland and Parker Thomas & Tucker; American Writing, Bradner and Whitaker; Japan Paper Company, Swigart; Hammermill Paper Company, Chicago Paper, Bradner and Swigart; Beckett Paper Company, J. W. Butler and James White; Strathmore Paper Company, James White, Chicago Paper, Swigart and J. W. Butler. The Marvellum Paper Company and DuPlex Envelope Company also had exhibits of unusual interest to visitors to the exhibits.

Association Activities

The Midwest Division of the Salesmens' Association of the Paper Industry has been fortunate enough to secure the Right Reverend George Craig Stewart as the speaker at the Christmas party of the Association to be held at the Hamilton Club on Monday noon, December 17. The Reverend Mr. Stewart has been for many years the chaplain of the association. One of the finest and most intellectual and inspirational of speakers, the Reverend Mr. Stewart is expected to attract a record crowd to the December 17 meeting, according to Jack Burrus, Albemarle Paper Company, program chairman.

The Chicago Paper Association last week elected officers of the association for the forthcoming year, with William Chukerman, of J. Chukerman & Sons, delegated as the newly elected president of the coarse paper organization. The November 13 meeting at the Blackstone also saw J. H. D. Murphy, Hanchett Paper Company, elected vice president in charge of the industrial division and Henry Thoms of the Peerless Paper Company, vice president of the retail division. James Danehy, perennial secretary-treasurer of the association and recently returned from a trip down into Old Mexico, was again honored with the office he has held so ably for so many terms. M. A. McNulty, retiring president, becomes chairman of the board. The 1934-35 Board of Directors will be made up of the above officers and Henry Burhop, Burhop Paper Company and Henry Weinstein, of the Western Bag & Paper Company. A complete roster of committee personnel and an outline of program for the coming twelve months is to be announced later by Mr. Chukerman.

Boston Paper Merchants Hold Autumn Meeting

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 26, 1934—With 77 members and guests present and a highly interesting speaker, the annual fall meeting and dinner of the Boston Paper Trade Association, held at the Exchange Club Wednesday evening, was most entertaining and successful. There was a reception and general get-together for a half-hour before the dinner. Group singing during the banquet, with E. Lindsey Cummings as leader, and piano accompaniment, made the gathering all the more congenial.

Besides the speaker of the evening, Edward Elwell Whiting, the well known writer and lecturer, at the head table were: Frederic W. Main, president; Charles A. Esty, past president, William N. Stetson, Jr., recently elected president of the New England Paper Merchants Association; F. Bendel Tracy, first vice president; W. J. Raybold, second vice president; T. Charles Casey, treasurer, and J. L. Hobson, secretary. As the members and guests were seating themselves, President Main called attention to the fact that it was through John E. A. Hussey, a member of the Exchange Club, that members of the association were guests and asked them to give him a hand — which was given with a will.

New Members Elected

In opening the post-prandial exercises, the toastmaster mentioned Mr. Esty as the most recent past president. In the business meeting, it was voted to dispense with the reading of the minutes of the last meeting. The following were elected as new members: Regular membership, Kilby P. Osborn, of the St. Croix Paper Company, proposed by John L. Hobson; special membership, Paul M. Beach, of the Riegel Paper Corporation; and Bruce U. Gardiner, of the Frank M. Sayford Co., Inc., both proposed by F. Bendel Tracy. The chair appointed as nominating committee Charles E. Proctor, John E. A. Hussey, J. W. Vivian, M. L. Madden and C. L. Baird.

In introducing the speaker, Toastmaster Main paid a tribute to the father of Mr. Whiting, who was editor of the *Springfield Republican* and held in great respect. He noted that an associate of Mr. Whiting, Sr., was the father of Courtlandt B. Griffin, the latter the president of the Carew Manufacturing Company, who was present at the dinner. He presented the speaker as an author and journalist, who would talk on "What's What and Why."

Edward E. Whiting Addresses Gathering

Mr. Whiting expressed his thanks for his introduction and what President Main had said about his father. His address was largely reminiscent and a commentary on presidents and men in public life, with the main theme that politics is extremely personal. He related many amusing stories about presidents of the United States. He noted three things which politics involved. An issue, the man to fit the issue and human nature does not change. Mr. Roosevelt has settled on the third of these and has played upon human nature. Every politician plays on human nature. Discussing Coolidge and telling campaign stories he said that he stood aloof, but was a man of the greatest personal sentiment. He noted the idea expressed by newspaper correspondents of a hick lawyer as president of the United States, but in a short time they were eating out of his hand.

Mr. Whiting suggested keeping an eye on Mr. Curley (Governor-elect of Massachusetts), handicapped at the start, a man of art and a strategist at politics. He told an interesting story about Curley. Hoover is a hard worker, but has not much sympathy with human nature. Mr. Whiting maintained that the Republican party is not dead, but has no issue. If we go away from Roosevelt, where are we going? We have got to get out of the depression and have stability of labor and stability of the home. The Republicans have got to work out a program in opposition to the present program.

Speaking of possible Republican presidential candidates, he mentioned Vandenburg, Governor Winant of New Hampshire, James Wadsworth and Borah. "I admire Borah, a wonderful starter and a poor finisher. He is the biggest man the party has." He mentioned also David A. Penrose of Pennsylvania, Reed of Ohio and Frank Knox, the last spoken of by a bearer. The speaker closed with the words, "The point is, politics is extremely personal and that is about all there is to it." Mr. Whiting was given tremendous applause and a vote of thanks for his address.

Those present were: W. J. Raybold, W. N. Stetson, Jr., Charles A. Esty, Edward E. Whiting, F. W. Main, F. Bendel Tracy, J. L. Hobson, H. A. Lindenburg, L. H. Young, J. W. Whitney, Karl Ways, Lionel A. Walden, Charles A. Shaw, Clifford H. Harris, Grafton Houston, M. O. Byrne, Robert M. Stone, Harold A. Allen, Walter P. Simonds, John Kelley, Edgar P. Hay, C. E. Rice, C. H. Dodge, C. Frederic Wellington, E. W. Pierce, Hubert L. Carter, N. S. Clark, Ralph L. Day, R. B. McDougall, Arthur M. Burr, Chas. W. Fields, J. E. A. Hussey, S. W. Bartlett, Irving N. Esleeck, Courtlandt B. Griffin, Norman Harrower, Kilby Osborn, Edward H. Little, Charles F. Foster, Leon W. Poore, Arthur C. Hall, E. H. Sussenguth, W. H. Loud, H. C. Upham, W. Gardner Very, Percy E. Weston, H. C. Thayer, W. E. Porter, Jr., J. W. Vivian, Wm. Ross, E G. Howarth, S. G. Ashley, R. H. Campbell, R. B. Rising, E. T. Simpson, N. E. Chase, J. G. Swift, Sr., Fred Matchman, E. W. Beals, J. Gilbert Swift, R. B. Taft, Fred B. Korbel, Joseph D. Starr, Jr. E. R. Lyman, E. O. Hanson, J. R. Whitney, Charles J Brown, Paul M. Beach, Wm. J. McLellan, Ernest S. Reid, Wm. C. Ross, Jr., Bruce U. Gardiner, John E. Roach, Arthur F. Fay, Paul S. Fiske, T. Charles Casey and E. L. Cummings.

Swedish Paper Market Quiet

The Swedish paper market, along with others, has experienced the usual quiet of the holiday season. Sales of all kinds of paper during the quarter were considered satisfactory for the time of year, but the expected increase in September did not take place. The British market continued with fair purchases and Swedish exporters look for increased orders during the autumn months. In the Far East, Japanese competition is being felt, particularly in China, while exchange difficulties and transfer restrictions hinder business in South America. • In the newsprint market, uncertainty as to the United States market, particularly with reference to the operation of the NRA codes, prevails, but American consumption is reported here as much improved in comparison with immediately preceding years. Efforts have been made to raise the basic prices for 1935 delivery, but have met with considerable opposition, and any such raises are not considered likely unless consumption markedly increases. By the end of September Swedish mills had sold almost all of their 1934 output. Some contracts are already reported to have been closed for 1935 delivery, but not as many as is ordinarily the case at this season.

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W. J. Brown to Be in Charge of Paper Section

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 27, 1934—W. J. Brown of this city has been appointed Deputy Administrator in charge of the paper and pulp section according to announcement by NRA on Monday. Mr. Brown succeeds Lieut. Tulley, deputy in charge of the paper division who resigned some weeks ago to return to his post in the army. It is understood that Lieut. Tulley recommended F. C. Lowthorp, well known in the paper industry to succeed himself. Mr. Lowthorp has been attached to the paper division as assistant deputy administrator since January. The report here is that Mr. Lowthorp will leave the Washington organization of NRA in the near future.

Mr. Brown organized the Black and White and Yellow Cab companies of this city and was president of these companies for thirteen years. For five years Mr. Brown served on the board of directors of the Federal American National Bank and since April of this year has been a technical adviser of the Recovery Administration.

Paper Distributing Trade Code Authority Empowered to Gather Data for Report

The National Industrial Recovery Board has authorized the Code Authority for the paper distributing trade to gather from members of the trade information and statistics needed for its forthcoming report upon the results of the code's replacement cost and labor allowance provisions.

These provisions declare the practice of selling merchandise below the replacement cost to the seller to be an unfair trade practice, and require members of the trade to include in their prices an allowance for the actual wages of labor. Originally approved until July 1, 1934, they have been extended until January 31, 1935. Minimum mark-ups establishing the allowances for wages of labor, to be added to replacement costs, have been determined by NRA and are in effect until January 31.

The Code Authority has been asked to report upon the workings of the provisions, to enable the National Industrial Recovery Board to decide whether to continue them after January 31. At a public hearing September 14, the Code Authority informed NRA that it had not been given sufficient time to prepare the report. The code requires the Code Authority to obtain NRA approval before it collects trade data of the kind needed for this report.

The Board's order empowers the Code Authority to gather reports including "specific data and information relating to sales in dollars, by weight and by classes of sales and kinds of products; stocks on hand, on order and in transit, in dollars and by weight; kinds of merchandise dealt in; unfilled orders; number of employees, wage rates, employee earnings and hours of work; and published prices and price lists."

The approval is effective for six months.

John J. Wefring Dead

John J. Wefring, assistant manager of the Waterfalls Paper Mills, Mechanic Falls, Me., during the past 14 years, died Tuesday evening, November 20, at the C. M. G. Hospital after a brief illness.

Mr. Wefring was born in Norway, November 8, 1892, the son of Amdr. G. and Ingeborg Jeremiason Wefring, and was a former member of Monami Lodge, I.O.O.F. Interment was at Maple Grove Cemetery, Mechanic Falls, Me.

Ground Wood Mill at Northumberland Burned

NORTHUMBERLAND, N. H., November 26, 1934—The ground wood mill of the Wyoming Valley Paper Mill was destroyed by fire here Saturday night with a loss of about $75,000. Amedee Desrosiers, tower boss, and Denis Breault, beater room foreman, were burned to death.

Authorities said they believed Desrosiers and Breault were the only employees in that part of the plant when a short circuit on the electric switchboard put out all the lights in the mill and a gale blowing across the Connecticut river fanned the shower of sparks into a terrific volume of flames.

Officials of the company said that none of the 350 employees of the mills would be thrown out of work by the fire. Construction of a new pulp plant will begin at once, and until it is completed, power will be purchased from the Twin-State System and prepared pulp will be bought outside.

The company has enjoyed unusual success since it was purchased by the present owners in 1923. For more than 10 years it has been running practically at capacity. It specializes in tissue paper, paper napkins and wax paper and is the mainstay of the community of Northumberland.

During the process of reconstruction, it was said, even more men than usual will be employed, first to clear away the debris, and then to work on the new pulp mill.

International Paper and Power Co. Earnings

International Paper and Power Company reports that consolidated gross revenue in the third quarter of this year was $34,892,143 compared with $37,329,985 in the third quarter of last year; consolidated net revenue including other income, before charges, was $9,835,226 against $11,844,557; and a net loss of $1,581,572 after all charges including depreciation, compared with a net profit of $431,259 in the third quarter of 1933.

In the first nine months of this year consolidated gross revenue was $106,482,583 against $99,014,559 in the corresponding period of last year; net revenue including other income, before charges, was $31,537,097 compared with $31,112,438; and a net loss of $3,625,128 after all charges including depreciation, against a net loss of $3,343,231 in the first nine months a year ago.

Comparative consolidated statements are as follows:

Quarter Ended September 30	1934	1933
Gross revenue	$ 34,892,143	$37,329,985
Net revenue, including other income	9,835,226	11,844,557
Less: Int. and disc. on funded debt, other int., income taxes, sub. divs., and amounts applicable to minority stocks of subsidiaries	8,802,137	9,119,102
Depreciation and depletion	2,614,661	2,294,196
Net loss	1,581,572	.....
Net profit	.....	431,259
Nine Months Ended September 30	**1934**	**1933**
Gross revenue	$106,482,583	$99,014,559
Net revenue, including other income	31,537,097	31,112,438
Less: Int. and disc. on funded debt, other int., income taxes, sub. divs., and amounts applicable to minority stocks of subsidiaries	27,052,500	27,500,058
Depreciation and depletion	8,109,725	6,955,611
Net loss	3,625,128	3,343,231

In his remarks to shareholders, Archibald R. Graustein, President, says:

"The less favorable showing during third quarter this year was due primarily to three factors. Earnings of power subsidiaries were lower as their consolidated gross revenues declined and their operating expenses and taxes rose sharply. Tonnage deliveries of pulp and paper ran about 17% below the record high level of the third quarter of 1933 and cost of labor and materials have risen. Provision for depreciation totalled $2,418,185 this year as against $2,076,096 last year."

1935 LOCKWOOD'S DIRECTORY of the PAPER & ALLIED TRADES Edition

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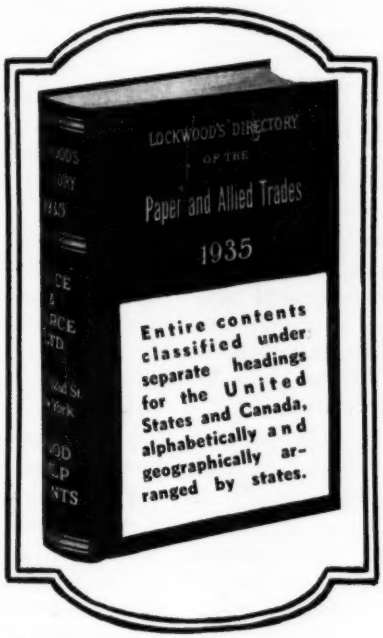
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THE POWER SHOW

The Eleventh National Exposition of Power and Mechanical Engineering takes place December 3 to 8 at Grand Central Palace, New York, during the same week as the annual meeting in New York, of the American Society of Mechanical Engineers. Engineers and technical men generally and the executives of industrial companies have, every two years, this doubly rich week in store for them. In addition to the well rounded and valuable program of technical papers which is scheduled for the meetings of the A.S.M.E., at the Engineering Societies Building, the exposition will tell the story of modern progress in power and mechanical engineering, visually, at Grand Central Palace.

Improved heating and air conditioning, representing a field of increasing industrial interest will be the subject of numerous exhibits at this year's Power Show. In the same department of the exposition there will be direct-connected blowers with remote variable air control feature, spot coolers, humidity control systems, cooling towers, and dust separators.

Associated with the air conditioning exhibits will be a wide range of portable electric blowers and industrial vacuum cleaners for use in the factory. Under the same heading of mechanically generated, controlled, and directed streams of air, will be hot air blowers, furnace vacuum cleaners and insecticide sprayers.

Related to the control of all mechanical processes and machines will be the exposition's section on instruments. Included in this section are recording and integrating fluid meters, air operated combustion controls, pyrometers, complete combustion and humidity control systems. There will be meters to facilitate economical boiler operation and the various types of controls will be illustrated with reference to the numerous boiler types and sizes. Applications will be illustrated for power plants, paper mills, steel mills, and oil refineries. The latest boiler meters will record steam flow, air flow, and flue gas temperature, all on a single, uniformly graduated chart. They will indicate the total steam flow on a six digit counter which reads like an automobile mileage register. Totally the device provides a combustion guide which any boiler operator can easily understand. When the operator adjusts the boiler damper or fuel control according to the chart scale, he knows that the boiler is being operated in the most economical manner possible.

Piping systems and accessories, will include proportioning pumps, oiling and greasing systems, and valves. Other units on display will be enclosed type lubricators, diaphragm valves for all services, single plunger pumps for proportioning chemicals, and single line greasing systems and pumps for boiler water treatment.

The subject of packing will include mechanical rod, and sheet packings, also steam and hydraulic packings of special interest to steel plants, power plants, and steamships. One exhibitor will show a steel and asbestos combination gasket which will "make weeping boilers dry their tears." For the piping field there will be constant-support pipe hangers which carry the pipe lines with complete freedom of movement in any direction. Bronze, iron, and steel valves will be shown for handling a wide variety of fluids covering the complete range of power plant conditions. Motor operated valves and mechanical rubber goods will be other specialties, and there will be a display of automatic sprinklers and other fire prevention devices.

Automatic zeolite water softeners will include emphasis on a new high capacity greensand-base zeolite. The display of water treating and water softening equipment will include a variety of accessory devices. The new greensand-base zeolite is said to be approximately twice the base-exchange capacity of greensand.

Plant maintenance and safety will provide the subject for a great many interesting operating exhibits.

Features of the transmission section of the exposition will include a display of ancient machines equipped with modern motor drives. The idea of this display is to show manufacturers who are limited to old machines how they can improve their performance by the most modern transmission devices. Those responsible for the upkeep of vocational schools and engineering school laboratories are among the groups appealed to by this display.

Other transmission items exhibited will include tension control motor bases, flat pulleys, hangers, and collars; dynamometers showing the actual belt tensions under different loads. There will be safety belt fasteners for belting that is shifted by hand and a large line of belt fasteners for every kind of belt used in transmission and conveying.

Little devices as well as big machines will not be neglected. In addition to the great machines and the multiple horsepower transmission devices and the systems of operation and control for entire factory units, there are literally hundreds of other items which will intrigue the

eye of the Exposition visitor this year. For instance, draftsmen will be shown not only the improved drafting tools of their profession, but high speed steel pointed drawing pens, inks, and new lettering devices. Photomicrographs will be exhibited. There will even be a four color automatic pencil. It is described as a "practical mechanical masterpiece invented by a brilliant engineer and practically damage-proof." Colors can be changed with trigger-like speed.

With every stride in mechanical production there must be comparable development in electrical facilities. The exposition's display of motor units and control devices will touch the problems of those responsible for everything from the large central station to the successful functioning of one small machine. Motor control is divided into four functions, each of which will be demonstrated. These functions are described as starting, stopping, regulating, and protecting industry's motors. Weatherproof and explosion proof safety switches will be featured in addition to photo electric devices, solenoid operated brakes and electronic equipment.

Regulation of the Sale of Job Lots and Seconds Below the Filed Price

There has been some very favorable comment regarding the way the job lot situation is being handled by the Writing Paper Division, especially in New York City. A bulletin has just been issued by E. H. Naylor, secretary of the Executive Authority of the Writing Paper Division, covering the procedure that is being carried out. It has been aptly said that "many crimes have been committed in the name of job lots" in the paper business in general, and the Writing Paper Division of the industry in adopting this procedure again points the way to handle a delicate situation as it has so frequently in the past. The bulletin is as follows:

In accordance with its obligation under Section 3, Article VII of the General Code, the Executive Authority of the Writing Paper Division has established the following regulations regarding the sale of job lots and seconds below the filed price:

Job lots and seconds of all quantities of sulphite papers, and of more than case quantities of rag content papers may not be sold at less than the mill's filed price for the grade without the consent of the Executive Authority.

On rag content papers only, sales of job lots and seconds in less than case quantities may be made without first obtaining permission from the Executive Authority; but in such instances they must be summarized and reported once each month to the Secretary of the Division.

In acting upon requests for permission to sell job lots and seconds of sulphite papers at below the filed price in the New York market, the New York Job Lot Committee (consisting of two mill members, two merchant members and a chairman selected by the four) act on the requests and send their recommendation to the Executive Authority, with whom the final decision rests. Every permission granted by the Executive Authority for the sale of job lots and seconds at less than the mill's filed price is conditional on the following:

A. Labeling.

Each package shall bear the official job lot labels, together with the permit number which will be given to a mill at the time the consent of the Executive Authority is given.

Attached are two specimen labels, the smaller one to be used on the ends of packages when paper is sealed. One large label is required to be pasted on each carton, bundle, case or skid. When permission to sell job lots is given by the Executive Authority as referred to above, the required number of labels with the proper permit number will be furnished to members at cost of printing.

The space at the left-hand side of "Permit Number" may be used to include the mill's name if desired. The space on the right-hand side of "Permit Number" must contain the permit number.

This permit number must appear on the invoices covering the sale.

B. Invoices.

When the Job is sold a copy of the invoice must be sent to the Writing Paper Division Secretary's office showing the permit number under which it was sold. It is optional with the mill whether they give the buyer's name or not.

Information required when applying to the Executive Authority for consent to sell job lots and seconds at below the mill's filed price:

1. Samples of every lot and lot numbers.
2. Complete detail for each lot as to
   a. Quantity
   b. Size and weight
   c. Color
   d. Grade
   e. Finish
   f. Date of Manufacture
3. Reasons for its being a job lot. If below standards for any reason, then submit standard samples for comparison.
4. Minimum price at which it is to be sold after permission is granted.
5. Territory where it is to be sold.
6. Number of permit labels (small and/or large) needed and where they are to be sent when permission is granted.

University of Idaho Research Fellowships

Two $400 Fellowships have been given to the School of Forestry, University of Idaho by Potlach Forests Inc., Lewiston, Idaho. These awards are made for the purpose of studying the chemical utilization of wood and the chemical plasticity of wood.

Potlach Forests Inc. is the largest lumber company in Idaho and is a part of the Weyerhaeuser Timber Company.

The Fellows were selected by Dean R. E. McArdle of the School of Forestry, and are Leslie L. Larson of Blackfoot, Idaho, who graduated from Idaho in June, 1934, and Joseph L. McCarthy, of Spokane, Washington, a 1934 graduate of the University of Washington.

The fellowships will be under the direction of Dr. E. C. Jahn, associate professor of forestry, in charge of the Wood Conversion Laboratory, and a member of the Technical Association of the Pulp and Paper Industry.

Erving Paper Co. Rushes Addition

ERVING, Mass., November 26, 1934.—Work is being rushed on the $20,000 addition to the Erving Paper Company mill of this town. It will add about 128,000 additional square feet of floor space. It is being built entirely of brick steel and concrete with two floors each 80 x 80 feet and with walls and foundation sufficiently strong so that a third story may be added if found advisable.

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CONSUMERS throughout the Southwest can now get deliveries of alkali in a matter of *hours!* Beginning this month, Mathieson's plant at Lake Charles, Louisiana, offers this fast delivery service.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Specialties

Japanese Paper. H. Kotte. Papier-Ztg. 59, No. 46: 788, 790; No. 47:804, 806 (June 9, 13, 1934).—The article describes the manufacture of genuine Japanese handmade paper, for which the fibers of gampi, mitsumata and kodzu are employed.—C. J. W.

Nine Kinds of Paper and Their Electrical Uses. Francis A. Westbrook. Elec. Mfg. 13, No. 4:28-30 (1934).—A general outline.—C. J. W.

Straw Halfstuff. A. P. Petrov. Bumazhnaya Prom. 13, No. 3:56-61 (1934); C. A. 28:5235.—A discussion of the use of chemical straw halfstuff in the production of wrapping paper, based chiefly on foreign practice.—C. J. W.

Paper for Drawing and Similar Use. Kalman Rezsny. Hungarian pat. 109,877 (May 1, 1934); C. A. 28:5240.—Paper is coated with a mixture of fine grains of a polishing material, e.g., zinc white, baryta, calcium carbonate, suspended in mastic or latex solution. Dyes may be added.—C. J. W.

The Molding of Board. K. Sherer. Papier-Ztg. 59, No. 38:676, 678-679; No. 39:691-692; No. 40/41:710; No. 43:744-746; No. 44:760, 762 (May 12, 16, 19, 30, June 2, 1934).—A detailed description of the subject is given, including a discussion of the machinery used, the material and its properties, the preparation of the board prior to molding, the mechanical processes taking place during the molding and the formation of folds. The article is profusely illustrated.—C. J. W.

Production of Waterproof Carton. N. I. Vasin. Bumazhnaya Prom. 13, No. 4:43-48 (1934); C. A. 28:4902.—A satisfactory product was obtained by impregnating chemical and mechanical pulp with an emulsion of kaolin and bitumen.—C. J. W.

Production of Asphalted Pasteboard. N. Perekalskii and N. Podlipnev. Materialui Vsesoyuznuii Nauch.-Issledovatel. Inst. Bumazhnoi Tzellyulozni Prom. (Trans. All-Union Sci. Research Inst. Paper Cellulose Ind.) 1932, No. 1:52-57; C. A. 28:4902.—The experimental work in the production of pasteboard by impregnation with asphaltic emulsions is based on the United States practice.—C. J. W.

Waterproofing of Paper or Cloth. Bugyuro Yokota and Terugo Sato. Japan pat. 101,049 (May 11, 1933); C. A. 28:4908.—Paper or cloth is painted with a mixture of polymerized product of drying oil, petroleum, sodium sulphide, calcium acetate and ferric hydroxide and a mixture of drying oil, lead oxide, Turkey-red oil and arum-root powder.—C. J. W.

Waterproofing Paper, etc. Sydney J. Sottero and Aline B. Alexander. Australia pat. 5604/32 (April 13, 1933); C. A. 28:4600.—The composition contains shellac 22, rectified spirit 75 and formalin 3 per cent.—C. J. W.

Manufacture of Multi-Ply Paper Board. DeWitt O. Jones and George C. Krug, assignors to E. I. du Pont de Nemours & Co. U. S. pat. 1,961,365 (June 5, 1934).—In the manufacture of multi-ply paper board in which a sized and water resisting liner is used, in order that silicate adhesive may be used and set quickly enough between the time of application and of cutting the web, a very dilute solution of a suitable wetting agent (preferably sodium isopropyl naphthalene sulphonate) is applied to the sized surfaces to which the adhesive is to be applied, and is dried before applying the silicate.—A. P.-C.

Process and Apparatus for Making Coated Paper. Charles G. Bright assignor to Paper Patents Co. U. S. pat. 1,964,312 (June 26, 1934).—In coating paper directly on the paper machine, after it has passed through some of the driers to effect partial drying, the sheet is pressed at a point just before the coating is applied.—A. P.-C.

Coating Machine. William J. Eisner assignor to Newark Paraffine and Parchment Paper Co. U. S. pat. 1,964,343 (June 26, 1934).—Paper or other strip material is rendered moisture-, porous-, dry- and air-proof by applying a coating of paraffin, wax, gum, oil, resin, sizings, clay, etc. The coating is applied in liquid form as it passes between the applying roll and a heated pressure roll, is passed over a smoothing roll that removes the wrinkles and is wound directly on a mandrel, the path between the applying and winding rolls being sufficiently long for the sheet to dry.—A. P.-C.

Method of Wax-Coating Paper. Van Hamm Wilshire assignor to The Specialty Papers Co. U. S. pat. 1,963,058

(June 12, 1934).—Paper is passed through a bath of hot paraffin, or coated on one or both sides with paraffin, and wound hot. After allowing the roll to stand sufficiently long for the paraffin to impregnate the whole paper, the roll is unwound, a second coating may or may not be applied to one or both sides; the paper is passed between smoothing rolls, around cooling rolls, and rewound.—A. P.-C.

Adhesive in the Form of Sheets. Richard G. Drew assignor to Minnesota Mining and Manufacturing Co. U. S. pat. 1,959,413 (May 22, 1934).—A gummed tape suitable for applying painters' masks is made of a porous paper impregnated without excess with a gelatin solution containing a flexibility-augmenting agent (*e.g.*, glycerine). The gelatin on one face of the sheet is rendered water resistant (*e.g.*, by treating with formaldehyde, gallic or tannic acid, chromium salts, etc.), and a pressure-sensitive adhesive coating of a glue is applied to the other face.—A. P.-C.

Apparatus for Cutting Roofing Elements. Arthur L. Barrall assignor to The Patent and Licensing Corp. U. S. pat. 1,961,896 (June 5, 1934).—In a mechanism for cutting roofing elements, positive ejection of the cut-out portions from between the cutting blades is obtained by providing a plunger so arranged and operated that the cut-out portions caught between the blades are pushed outwardly clear of the blades by a plate fastened to the outer end of the plunger, the inner end of which contacts with a cam in the interval of time between successive contacts of the cutting blades and the sheet to be cut.—A. P.-C.

Bituminized or Impregnated Felt. Milton O. Schur and Walter L. Hearn assignors to Brown Co. U. S. pats. 1,961,945 and 1,961,946 (June 5, 1934).—*No. 1,961,945*—A felt suitable for impregnating is made of unbeaten, high alpha-cellulose wood pulp (with or without admixture of roofing-rag stock) containing up to 10 per cent of raw starch. *No 1,961,946*—The pliability and folding endurance of bituminized felt are considerably increased by using a fibrous furnish consisting of 60 to 85 per cent of beaten rag pulp and 40 to 15 per cent of unbeaten, high alpha-cellulose wood pulp.—A. P.-C.

Roofing. Arthur D. MacNutt assignor to Certain-Teed Products Corp. U. S. pat. 1,963,752 (June 19, 1934).—The particles of grit used for surfacing roofing are covered with a hard or semi-hard, transparent or semi-transparent, water-insoluble and bituminous-oil-insoluble coating, preferably by applying a solution of a natural (*e.g.*, Kauri) and (or) synthetic resin (*e.g.*, "amberol") in an organic solvent.—A. P.-C.

Folded Toilet Sheet. George Carruthers assignor to Interlake Tissue Mills Co., Ltd. U. S. pat. 1,961,195 (June 5, 1934).—Sanitary paper covers for toilet seats are folded in a succession of narrow overfolds so as to effectively support the broken edges of the sheet to prevent them from becoming torn.—A. P.-C.

Paper Towels and Method of Making the Same. Courtney P. Winter and Dunbar A. Rosenthal assignors to U. S. Paper Mills Inc. U. S. pat. 1,964,700 (June 26, 1934).—Paper towels are formed of two creped sheets arranged with their relatively rough surfaces innermost and their relatively smooth surfaces outermost.—A. P.-C.

Manufacture of Artificial Leather. John C. Sherman assignor to Brown Co. U. S. pat. 1,961,916 (June 5, 1934).—Dry pulp sheets are disintegrated into a loose fluffy mass which is sifted on to a traveling fine-mesh endless wire cloth which travels at such a rate that the pulp builds up to a thickness of about 3 inches. After pressing to a thickness of about 5/8 in. the sheet is impregnated with a bonding and reinforcing composition, preferably made up of rubber latex, glue and formaldehyde or other tanning agent.—A. P.-C.

Felting Machine for Making Sanitary or Surgical Pads. Harrison R. Williams. U. S. pat. 1,961,272 (June 5, 1934).—Carded or shredded wood pulp in dry condition and in extremely light form, resembling a snow storm, is drawn by suction on to a fine-mesh, endless, traveling screen, and is charged with antiseptic or deodorant materials, which is applied in spray form before the pulp is pressed into pad or web condition.—A. P.-C.

Paper Product. George A. Richter and Milton O. Schur assignors to Brown Co. U. S. pat. 1,961,914 (June 5, 1934).—The wet strength of paper for towelling, etc., is considerably increased, without appreciably, affecting its absorbency, by introducing as little as 1 per cent of regenerated cellulose so that it is not distributed uniformly throughout the thickness of the sheet, but forms a layer either near the center or at one or both surfaces of the sheet.—A. P.-C.

Molded Paper Articles and Art of Manufacture Thereof. Andrew Keiding assignor to American Lace Paper Co. U. S. pat. 1,963,134 (June 19, 1934).—Articles such as cups are formed by depositing pulp on a perforated mold through which the water is drawn by suction. The wet article is removed from the mold, dried to a 50 to 30 per cent moisture content, subjected to high pressure (preferably several hundred lbs. per sq. in.), and finally dried.—A. P.-C.

Process for Stamping Cardboard and Resulting Product. Etablissements P. Ravier. Fr. pat. 759,171.—In order to obtain deep impression by means of stamping without unduly weakening the board at the bends, the board is built up of a number of thin sheets, having the desired total thickness and coating on one or both sides with a non-hygroscopic paste of low melting-point which will melt under the action of the heat of the stamping press.—A. P.-C.

Printing Papers in U.S.S.R. R. R. Papeterie 56: 357-362 (April 10, 1934).—A discussion of standard printing paper grades in U.S.S.R.—A. P.-C.

Carbon Papers. Rinco A.-G. Fr. pat. 756,697 (Dec. 13, 1933).—A fundamental color which does not combine with the support and which is free from fats or waxes is applied to the support and to the fundamental layer is applied a second layer. The first layer may contain an aqueous solution of casein, Turkey-red oil, glycerin, lampblack and Prussian blue, and the second layer stearic esters of glycol, water and titanium oxide.—A. P.-C.

Coating Paper. Carrier-Ross Engineering Co., Ltd. Brit. pat. 401,980 (Nov. 23, 1933).—Webs of paper are coated by applying an excess of coating material with one roll, removing the coating from the surface of the web by a second roll, removing excess coating material from the second roll, and re-applying the coating material remaining on the second roll to the web. An apparatus is described.—A. P.-C.

Manufacture of Coated and Fancy Papers. M. Konowaloff. Papeterie 56: 174-181 (Feb. 25), 286-293 (March 25), 525-529 (May 25), 566-573 (June 10, 1934).—A description of the manufacture of coated papers and of the control of the raw materials and of the coating operation, indicating the precautions required to obtain a satisfactory product. The manufacture of various grades of fancy papers (various types of imitation-leather papers) is also briefly outlined.—A. P.-C.

Microscopical Examination of Paper

By John B. Calkin[1]

The present material is being published in order to serve as a guide to those wishing to work on the microscopical examination of paper. It has been modeled on the chapter in *Paper Testing Methods* dealing with the subject. In its present status it is intended to serve as a guide as there is still much to do before it could be considered complete. The writer would greatly appreciate comments and criticisms of the material.

The writer is indebted to Messrs. Chamot, Griffin, Mason, Morey, Petry and Scribner for reading parts or all of the manuscript and for critical comments on it. The writer also wishes to thank the following members of the Microscopic Sub-Committee who have read the manuscript and have reported on it: The Misses Griffin and Rollins, and Messrs. Bentzen, Foster, Geohegan, Kantrowitz, Krauss, Landes, Libby, McKinley, Perry, Peterson, Simmons and Spence.

1. Fiber Composition of Paper (55)

Apparatus

1. *Microscope:* A microscope capable of giving not less than 100 diameters magnification is necessary for the determination of fiber composition. It is desirable that the microscope be of the compound type and that it be equipped with a mechanical stage.

2. *Cross Line Disk:* This disk is employed to establish a dot or point for counting the fibers passing under it. The disk may be obtained in two ways:

(a) It is possible to construct a satisfactory cross line disk by the use of two silk fibers, approximately 0.01 mm. in diameter, obtained by untwisting silk thread. The fibers are drawn across the center of a round cover glass 18 mm. in diameter at right angles to each other, and cemented to the edges of the glass with paraffin or other adhesive and the protruding ends cut off. The cover glass is then placed, with the fibers on the under side, on the diaphragm of the microscope eye-piece, carefully centered on the diaphragm of the eye-piece of the microscope and cemented in this position with a drop of paraffin.

(b) A graticule or cross line disk is carried in stock by many manufacturers of optical equipment. It consists of a round thick disk of optical glass on which are engraved two lines at right angles to each other, running completely across the disk and intersecting at the center.

3. *Dropper:* This consists of a glass tube 6 in. (15 cm.) long and ¼ in. (6 mm.) internal diameter, fitted, at one end with a rubber bulb and having the other end carefully smoothed but not constricted.

Test Specimen

The specimen for test shall consist of pieces having a total area of not less than 6 sq. cm. (1 sq. in.) cut from different portions of the test sample and representative of it.

Procedure

Preparation for Examination

Place the specimen in a small beaker and completely cover it with a 0.5 per cent NaOH or KOH solution, heat to boiling, transfer the contents of the beaker to a small 200-mesh metal sieve and wash thoroughly with water. Roll the moist pieces of paper into a ball and work between the fingers to loosen the fibers. Transfer to a test tube and shake until the fibers are completely separated. Pour a portion of the mixture into a second test tube and dilute to a fiber concentration of about 0.1 per cent. Transfer the fibers to a microscope slide by means of the dropper. Thoroughly mix the fibers and water, quickly insert the dropper into the mixture 5 cm. (2 in.) below the surface, expel 2 bubbles of air from the dropper, then fill the tube to a distance of about 13 mm. (½ in.). Transfer the contents of the dropper to the slide, making 4 drops, completely emptying it *(51)*. Repeat this procedure until the slide is uniformly covered with drops of the mixture; then place the slide in an air bath at 100-105 deg. C. until dry. When cool, add stain as specified below to the dried fibers and press down on them a second slide or large cover glass. Remove excess moisture from the edges of the slide with absorbent paper. Prepare 3 slides in this manner.

Method of Observation[2]

Examine the prepared slides microscopically, using a magnification of not less than 100 diameters. Place the stained slide on the mechanical stage of the microscope, and count the fibers at various points in a straight line, twice lengthwise and 4 times crosswise of the slide, starting each line of observation at a different point. The number of each kind of fiber present in at least 25 different fields and a total of not less than 600 fibers, 200 on each slide, shall be counted.

Either of the two following methods shall be used to compensate for the difference in size of fibers:

A. Use the diameter of the fiber as observed through the microscope as the unit of measure, and give each fiber counted a value proportionate to this unit.

B. The following method is designed to eliminate the undesirable personal equation in the estimation of relative sizes of fibers involved in method A. Place a cross line disk on the diaphragm of the eye-piece of the microscope. As each fiber passes under the dot or point formed by the intersecting lines on the disk, count it as one regardless of its size. If aggregations of fibers such as occur in ground wood are encountered the number of single fibers in the aggregation shall be estimated and counted as if the fibers were completely separated.

Stains

For all purposes except as specified below, either the Herzberg or the Sutermeister stain shall be used. These shall be prepared with distilled water and C.P. chemicals and used as follows:

Herzberg Stain (28): Prepare the following solutions:

(A) An aqueous solution of $ZnCl_2$ saturated at 20 deg. C.

(B) 0.25 grams of iodine and 5.25 grams KI dissolved in 12.5 cc. of water.

Mix 25 cc. of solution (A) measured at 20 deg. C. with solution (B). Pour into a narrow cylinder and let stand until clear. Decant the supernatant liquid into an amber colored glass-stoppered bottle and add a small piece of iodine to the solution. Thoroughly moisten the fibers with

[1] Member TAPPI; Chairman, Microscopic Sub-Committee of the TAPPI Paper Testing Committee, Cornell University, Ithaca, N. Y.

[2] Suggested by H. T. Case.

this solution and remove the excess with blotting paper. Test the solution with known fibers and readjust if necessary by addition of either $ZnCl_2$ or iodine. The following colors are developed by this stain:

Red—Linen, cotton, bleached manila hemp.

Blue—Chemically prepared fibers low in lignocellulose, from wood, straw and esparto.

Yellow—Fibers high in lignocellulose such as ground wood, jute and unbleached manila hemp.

Sutermeister Stain (52): Prepare the following solutions:

(A) 1.3 grams of iodine and 1.8 grams of KI dissolved in 100 cc. of water.

(B) A clear, practically saturated solution of $CaCl_2$.

In using this stain, apply solution (A) after moistening the fibers with water, let remain about 1 minute, remove the excess by blotting and then add solution (B).

The colors developed by the Sutermeister stain are, in general:

Red or brownish red—Cotton, linen, hemp, ramie.

Dark Blue—Bleached soda pulps from deciduous woods.

Bluish or reddish violet—Bleached sulphite fibers and thoroughly cooked unbleached sulphite fibers.

Greenish—Jute, manila hemp and the more lignified fibers in unbleached sulphite.

Yellow—Ground wood.

Lofton-Merritt Stain (39): This stain shall be used for differentiating between unbleached sulphate (kraft) and unbleached sulphite fibers.

(A) 2 grams of malachite green in 100 cc. of water.

(B) 1 gram of basic fuchsine in 100 cc. of water.

Mix these in the proportion of 1 volume of (A) to 2 of (B). As dyes from different sources vary it is necessary to test them by staining known fibers. Unbleached sulphate fibers are stained blue or blue-green and unbleached sulphite fibers purple or lavender. If any purple fibers appear in unbleached sulphate fibers, this indicates there is too much fuchsine present and more malachite green solution must be added. The opposite is indicated if some unbleached sulphite fibers develop a green or blue color.

The Lofton-Merritt stain shall be used as follows: Add the compound stain to the fibers and let remain 2 minutes. Remove excess stain by means of a hard filter paper and add a few drops of 0.1 per cent HCl. After about 30 seconds remove the excess acid. Next add a few drops of water and remove the excess.

Bright Stain (9):[3] This stain shall be used for differentiating between bleached and unbleached fibers.

(A) 2.7 grams ferric chloride, $FeCl_3 . 6H_2O$, per 100 cc. of water.

(B) 3.29 grams potassium ferricyanide, $K_3Fe(CN)_6$, per 100 cc. of water.

(C) 3 grams of crude (not treated with sodium carbonate) substantive red dye, Dupont Purpurine 4 B. conc., or its equivalent, per 500 cc. of water.

These solutions must all be made with cold water. Filter (A) and (B) and keep in separate stock bottles at a temperature not exceeding 20 deg. C. Make (C) fresh each day it is used. For staining use tall narrow beakers, suspending the microscope slides in the beakers from clamps. Mix 10 cc. each of (A) and (B) in one beaker and add an equivalent amount of (C) to another beaker. Set the beakers in a water bath, the temperature of which must be maintained constantly within 19-21 deg. C. Place a thermometer in the stains. When their temperature is 20 deg. C. dip the slide containing the dry fibers in water to moisten it uniformly (so that no air bubbles will be formed when it is stained), then place the slide in stain (A+B) and let it remain 20 minutes. Wash by dipping in water 6 times, then renew the water and repeat the washing process. Dry the contents of the slide and repeat the processes of moistening, staining, washing and drying, using stain (C). It is desirable to fix the top glass on the fibers with a drop of balsam.

The colors developed by the Bright stain are:

Red—Bleached fibers or fibers practically free from lignocellulose.

Blue—Unbleached fibers or fibers containing lignocellulose.

Report

The proportion of the various fibers found shall be reported in terms of percentages of the total fiber composition, to the nearest 5 per cent. The following nomenclature which covers the fibers commonly dealt with shall be used in reporting results: Chemical wood; chemical deciduous wood; chemical coniferous wood; ground wood; manila; jute; rag; linen; cotton; esparto; straw.

2. Suggestions on Fiber Analysis

Equipment

The requirement for a microscope to be used only for routine fiber analysis is that it be of the compound type with a magnification of not less than 100 diameters.[4] This may be obtained, with the draw tube at 160 mm., by using a 10× eyepiece and a 16 mm. objective. Some manufacturers do not use this nomenclature so that the manufacturer's instruction book should be consulted. A mechanical stage greatly facilitates the making of fiber analyses. Higher magnifications and such accessories as a condenser, nicol prisms, dark field illuminator, etc., often facilitate the identification of fibers. The square or rectangular stationary stage type of microscope is probably the one most commonly used. It is cheaper than the other types and is carried in stock by instrument makers. The chemical microscope is a more useful instrument as it has a wider application for laboratory problems. Differences in design characterize this type of microscope which is carried by various manufacturers. There is a wide range of microscopes applicable to fiber analysis, so that before purchasing a microscope it is advisable to have in mind what types of work, other than fiber analysis, are to be done.

For best results for microscopic work, a clear north light is desirable and is to be preferred. However, where there is a large amount of routine testing that must be done, it is advisable to have a more constant source of light. There are various types of lamps available, but good results can be obtained with a common 50-watt lamp in conjunction with a blue "daylight" filter. It is to be noted that the color of the stained fibers on the slide will be somewhat different for the two kinds of illumination.

Preparation for Examination

The disintegration of parchment papers by the procedure specified in the *official method (55)* presents difficulties. Bartsch *(4)* has done considerable work on the disintegration of parchment papers. The following method is suggested as applicable to this type of paper.

Tear the parchmentized paper into pieces about 2 by 5

[3] As modified by the author.

[4] Krauss (private communication) states: "I use in routine work 75 diameters; which has the following advantages: The stained fibers are quite easily differentiated at this magnification; the color of the stain is more pronounced and a larger number of fibers can be counted in the same length of time. It is occasionally but not often necessary to rotate the nose piece to the 8 millimeter objective."

cm. and place in a 250-cc. beaker. Add about 50 cc. of 50 per cent H_2SO_4 (at 50-60 deg. C.) and stir. Let the H_2SO_4 stay on the paper until it is disintegrated into individual fibers and quite small pieces of paper. This operation requires 2-5 minutes. If the treatment is not sufficiently drastic, the paper will not disintegrate, and vice versa. Pour the contents of the 250-cc. beaker into about 1 liter of water in a 2-liter beaker, then strain the suspension and wash until acid-free. Roll small pellets between the fingers, place in a flask, shake, and dilute for test tubes as desired. In general, this disintegration does not interfere with the Lofton-Merritt stain for distinguishing unbleached sulphite and sulphate. With Herzberg's stain sulphite fibers appear reddish; also Sutermeister's stain is redder than usual.

Bartsch *(27)* has given another method for the disintegration of parchment paper which gives a fairly good differentiation with the Herzberg stain. Wisbar *(27)* has devised a special stain for use with disintegrated parchment paper.

Shaffer *(48)* reports that pretreating with alkali may be disadvantageous in certain cases for subsequent staining.

Preparation of Stains

Zinc chloride is marketed in 2 forms, fused sticks and crystalline. Apparently many analysts use the fused sticks which may contain an appreciable amount of insoluble zinc oxychloride. One method of preparing Herzberg's stain *(1)* specifies the use of fused sticks. A convenient way to use the $ZnCl_2$ is to purchase it in 50-gram bottles and use a fresh bottle for each preparation.

It is absolutely essential to have a satisfactory stain if the results are to be of value. To test out a stain make up a mixture of about equal parts of bleached soda pulp, bleached sulphite pulp, rag filter paper and groundwood. Prepare a microscopic slide from this mixture and stain with the stain to be tested. For the Herzberg stain, if the stain is correct, the soda pulp should show a dark blue color; the sulphite pulp, a light blue; the rag fibers, a red or wine-red color; and the groundwood, a bright yellow. For routine analysis it is unwise to "doctor" the stain; if it is not correct one should trace the cause of the poor stain and eliminate it. For those who care to "doctor" the Herzberg stain the following is given *(57)*: "If the blue is not clear, but tends toward the violet, too much iodine is present, and more water or zinc chloride should be added. Zinc chloride produces the blue color, iodine produces the red and yellow colors, and water serves to weaken the color that predominates."

In some cases where it is necessary to examine all grades of paper, some analysts consider it advisable to keep several Herzberg stains on hand. They consider that a stain which gives the best color on groundwood and bleached sulphite seldom gives a correct color on mixtures of rag, bleached sulphite and soda pulps. In such a case one Herzberg stain may be made up so that it will give a *bright lemon yellow* on a known sample of groundwood pulp and a *slightly greenish blue* on unbleached sulphite. For the mixture of rag, bleached sulphite and soda pulp, so adjust a second stain that the rag shows a *clear wine-red*, the sulphite a *blue*, and the soda fibers a *dark blue*. In testing out a stain always have on hand authentic samples of pulp so these mixtures may be made up. The Sutermeister stain and other stains should also be checked before use.

Stock solutions of stains should not be kept indefinitely. The length of time that a stain may be kept safely varies. It is often wise, especially for important analyses, to run a blank to be sure that the stains are working properly. An investigation on the deterioration of the Herzberg stain under various conditions has been made by Minnear and Withrow *(44)*.

Fiber Differentiation

For convenience in studying fibers it is desirable to have a classification of the fibers from a papermaker's standpoint. Such a classification is shown in Table I[5]. It is to be understood that this is not a botanical classification and any standard textbook on botany is to be consulted if that information is desired.

It should be pointed out that while the microscope yields valuable information, the methods of microscopy must be used with care and caution; the personal equation is often a large factor. Then too, it is necessary to deal with materials which are often abnormal, in the sense that the "ideal" material is seldom found. It is entirely possible that some characteristic fiber or cell may have been removed or lost. Beating may alter the fibers considerably. Caution should also be observed in interpretation of illumination effects. It should be borne in mind further that trials on known materials are a great help in identification.

Methods of differentiation are divided into 5 classes by Calkin *(13)*: 1. Morphology of fiber; 2. Staining; 3. Illumination effects; 4. Refractive index; and 5. Combination of two or more methods.

TABLE I.—CLASSIFICATION OF PAPERMAKING FIBERS

A. Seed hair fibers—fibers which grow on seeds: Cotton.
B. Bast fibers—from the inner bark of trees, shrubs and other plants: Flax (Linen); Hemp; Jute; Ramie; Kodzu (Paper Mulberry); Mitsumata; Gampi; Saw Grass.
C. Leaf fibers—from the leaf or leaf stalk: New Zealand Flax; Abaca (Manila); Sisal; Aloe, American (Century Plant); Pineapple.
D. Hull fibers: Cocoanut.
E. Stem fibers—from the main stem or trunk of the plant: Wood Fibers, Coniferous; Wood Fibers, Deciduous; Straw; Esparto; Bagasse; Cornstalk.

There is much excellent literature on the morphology of fibers including articles by Hanausek *(25)* and books by Hanausek-Winton *(26)*, Herzog *(31)*, Matthews *(40)*, and Carpenter *(14)*. Photomicrographs and descriptions of some of the more common papermaking fibers are shown in Figs. 1 to 11[6].

In the morphology of fibers there are two characteristics for differentiation, the type of cells (the term fiber is often used in a loose sense for cell) and the markings on those cells. Not only are these characteristic of the particular genera or species, but conditions of growth, climatic and geographical features may affect the morphology. The cells in a pulp may be well separated or only imperfectly separated, depending on the type of chemical process used in cooking. In the groundwood, or mechanical, process the pulp shows the presence of torn fibers and of bundles of fibers.

In the pulps from deciduous woods (Figs. 1 and 2) the fibers (f) are much shorter and somewhat narrower than the tracheids (t) of conifers (Fig. 3). The fibers contain bordered pits, but they are so small that they are only occasionally visible at 100 × and then many times only after careful examination. The fibers from deciduous or broadleaf woods (often called deciduous fibers) are not unlike many of those of the grasses (compare Figs. 1, 2, 8, 9, 10, 11), and it is only with the utmost care and with known samples for reference that such a mixture can be approximately analyzed. Fortunately such mixtures come up for analysis infrequently. The vessels (v)—more correctly termed vessel-segments—are char-

[5] cf. Clark (18).
[6] Photomicrographs prepared by Professor C. W. Mason of Cornell University.

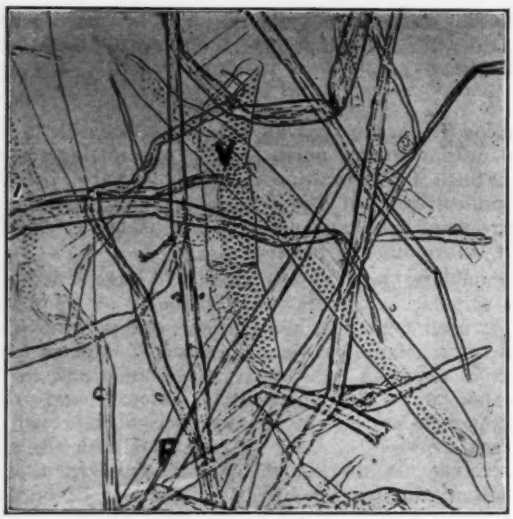

FIG. 1.
Popular wood pulp (Chemical). f, fiber; v, vessel—more correctly vessel-segment. 100 ×.

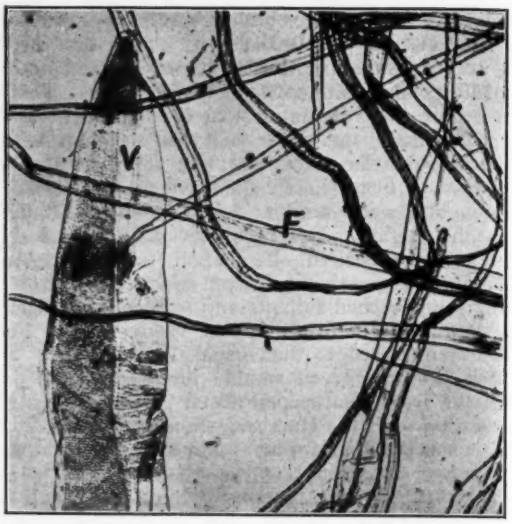

FIG. 2.
Birch wood pulp (Chemical). f, fiber; v, vessel—more correctly vessel-segment. 100 ×.

acteristic of pulp from deciduous woods, and are much less abundant than the fibers. They are considerably larger in diameter (never less than 2 or 3 times) than the fibers, and show obvious pits (p) in greater or less degree. The details of the shape, size and arrangement of the pits, and the size and shape of the vessels, serve to differentiate the various deciduous pulps.

The most characteristic cells in coniferous pulps (Fig. 3) are the long, thin-walled tracheids (t), marked by single or double rows of irregularly spaced bordered pits (bp) and sometimes by differently arranged, apparently simple, pits of various sizes. Tapering fibers, often with fairly thick walls, and with faint oblique fissures or surface striations are also found. The parenchyma cells are small, flat cells, usually having very tiny pits. The details of the various tracheids serve to differentiate the various coniferous pulps.

Groundwood (Fig. 4) is characterized by fine bits of torn fibers and by the presence of bundles of fibers. Some of these bundles of fibers show undisturbed groups of medullary rays at right angles to the tracheids. The general characteristics of the torn fibers and bundles may be used as an index to show the character of the pulp produced. Groundwood is usually produced from conifers, but deciduous woods are sometimes used.

Jute and manila constitute the majority, but not all, of the rope found in papermaking. It is sometimes essential to differentiate the rope. Manila fibers (Fig. 5) have a well-defined, quite uniform, uninterrupted central lumen (1) which differentiates them from the jute fibers (Fig. 6) which have a variable central lumen (1), changing in the same fiber from broad to narrow and even being entirely interrupted at certain places. Nodes and cross striations are absent in both manila and jute, but are present in some rope fibers. The cell walls of jute have longitudinal striations. Manila pulps *sometimes* have small cells (staining brown with Herzberg's stain) which occur singly or in groups; these are so infrequent that they cannot be considered characteristic but do de-

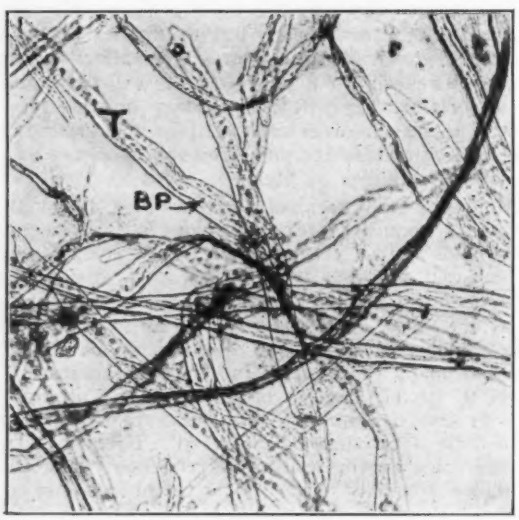

FIG. 3.
Spruce wood pulp (Chemical). t, tracheid, bp, bordered pit. 100 ×.

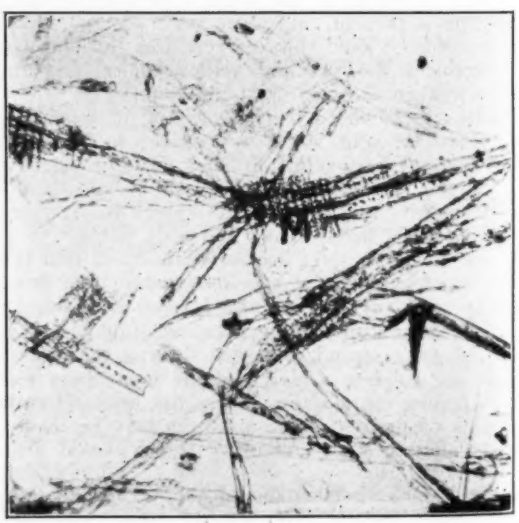

FIG. 4.
Spruce wood pulp (Mechanical). m, medullary ray. 100 ×.

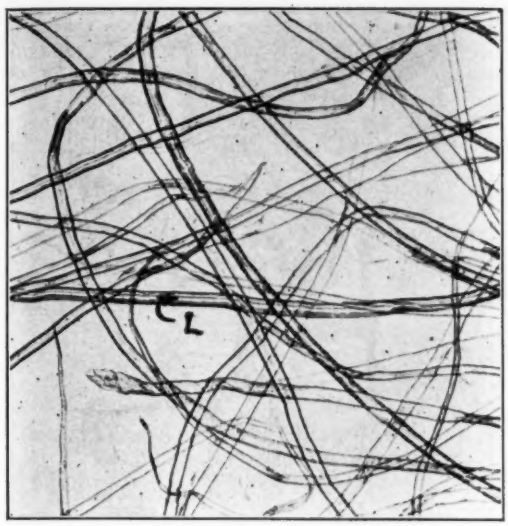

FIG. 5.
Manila (Abaca) fibers. l, lumen. 100 ×.

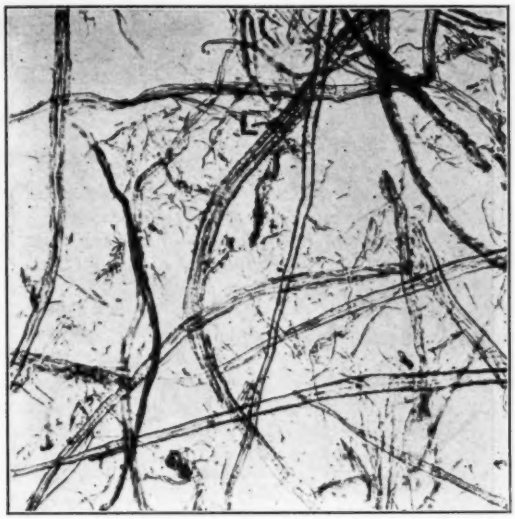

FIG. 6.
Jute fibers. l, lumen. 100 ×.

note the presence of manila if they can be found. Manila and jute can sometimes, *but not always*, be differentiated by the observation that jute stains yellow and manila wine-red with the Herzberg stain. In the analysis of rope papers there are cases where it may be advisable to take special cognizance of the different colors developed by jute and manila, as these colors are indicative of the previous history of the fibers.[7] "Unbleached jute stains a strong yellow with Herzberg stain; jute that has been cooked moderately and then bleached gives a lighter yellow color; after drastic cooking and bleaching the color is a steel blue or grey. Manila hemp may vary from a dark blue to a light red (not as deep as for rag), depending on the degree of cooking and bleaching."

Rag pulp (Fig. 7) consists of cotton and linen fibers. As rags usually undergo considerable treatment it is not always easy to distinguish the twists of cotton and the nodes of linen. Except in special cases they are not reported separately, being grouped under the general designation "rag."

Esparto (Fig. 8), the straws (Fig. 9), cornstalk (Fig. 10) and bagasse (Fig. 11) contain the widest variety of cells. Esparto is encountered in papers, especially some of those made in England; the others occur mostly in fiber board used for building purposes. The general class of grasses used for fiber board is in need of systematic study in order to differentiate them. The majority of the cells found in these pulps are the fibers (f), which are fine, slender and without distinctive structure. Serrated cells (sc), pith cells (pc)—or rings from annular vessels—and vessels (v) are present in all these pulps. Most characteristic of esparto are the "tear drop" or comma-shaped hairs or bristles, known as trichomes (t); but unless care is exercised they may be overlooked.

It is frequently desirable to make photomicrographs of fibers examined, as these serve as a permanent record.[8]

[7] Peterson, Private communication.

[8] For information on equipment and the use of it for this purpose it is suggested that analysts consult references (15), (20), (58), (61).

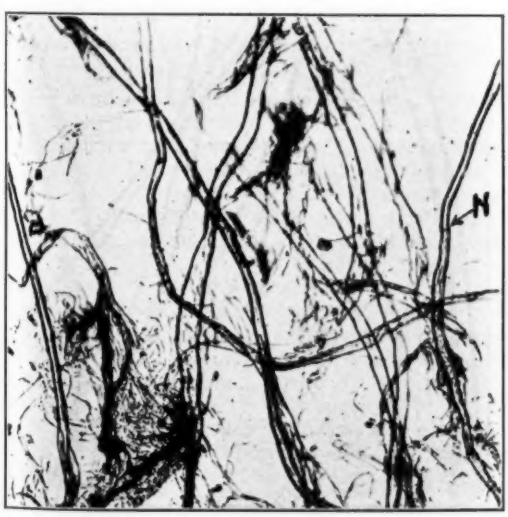

FIG. 7.
Rag pulp. n, node. 100 ×.

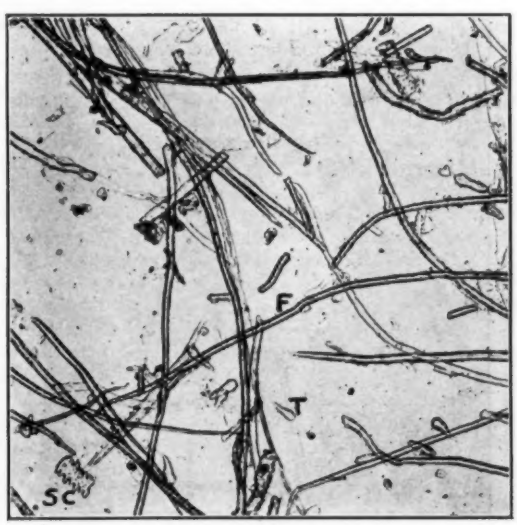

FIG. 8.
Esparto. f, fiber; t, trichrome; sc, serrated cell. 100 ×.

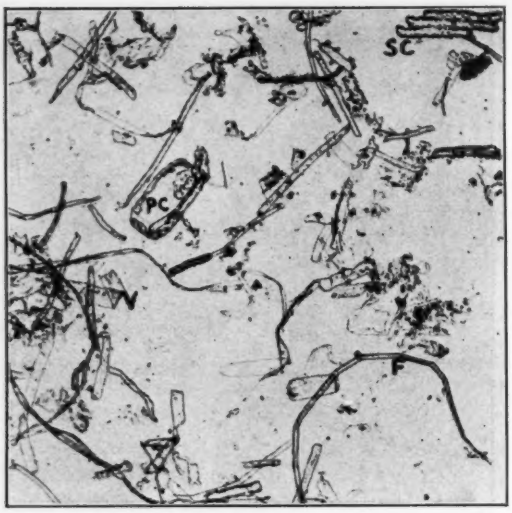

FIG. 9.
Straw. f, fiber; sc, serrated cell; pc, pith cell; v, vessel. 100 ×.

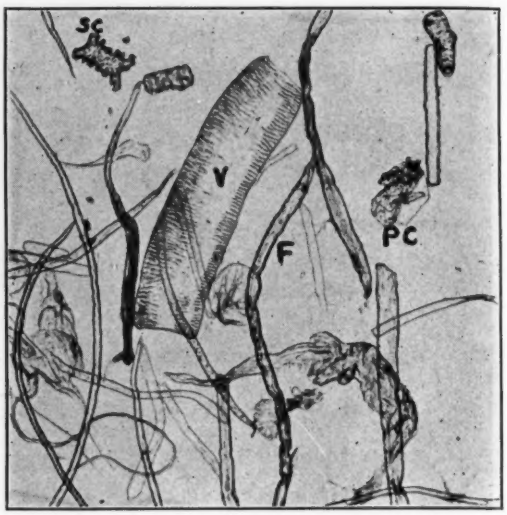

FIG. 10.
Cornstalk. f, fiber; sc, serrated cell; pc, pith cell; v, vessel. 100 ×.

It should be noted that morphological characteristics have certain limitations in fiber differentiation. Herzog *(34)* is unable to differentiate flax and hemp except by chemical means. Swett *(53)* also uses chemical means for certain rope fibers.

In routine fiber analysis staining is most commonly used for fiber identification. A set of colored plates has been prepared by the U. S. Bureau of Standards *(59)*,[9] illustrating eight paper fiber compositions as seen under the microscope. They are intended to serve as reference standards for use in the identification of paper fibers and in the estimation of the fiber composition of paper.

Various stains have been developed to differentiate between soda and sulphite pulp. According to Geohegan *(22)*, "The stains which are recommended for distinguishing between sulphite and soda fibers, distinguish between the fibers of coniferous and deciduous wood, and not between the methods by which they were cooked." Alexander's stain *(56)* is used. Geohegan considers Selleger's stain more convenient than the Alexander stain. He gives several modifications of the former stain and also two other stains for the same purpose.

Kantrowitz and Simmons *(34a)* have compared the Official Bright method, for the determination of bleached and unbleached fibers, with certain more rapid methods.

Fiber differentiation stains other than those given here are used *(54)*. There are a number of stains described in the literature; they should be examined critically on known samples before attempting to use them on analyses. The field of fiber differentiation stains is in need of systematic study and someone ought to undertake it.

There are many fiber characteristics which may be accentuated by using proper illumination. Chamot and Mason *(16)* and Gage *(21)* describe methods and technique of illumination effects. Care must be exercised to be on the watch for abnormalities in various fibers, and a set of known samples is a great help. Pleochroism has been used, according to Behrens *(5)*, for fiber identifica-

[9] Reproduced in "The Manufacture of Pulp and Paper," Vol. V, § 5, between pp. 66-67 (1929).

FIG. 11.
Bagasse. f, fiber; v, vessel; pc, pith cell. 100 ×.

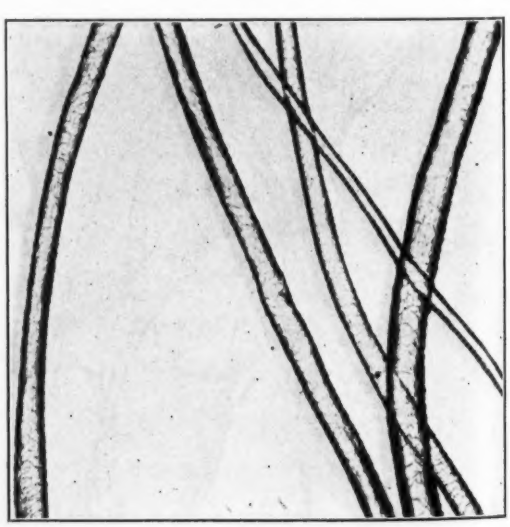

FIG. 12.
Wool fibers. 100 ×.

tion. Refractive indices *(32) (33)* may also be helpful in identification.

In addition to the vegetable fibrous raw materials, wool is commonly used for papermaking. It is usually found in building paper *(1)*, and sometimes in mulching paper. The fibers are illustrated in Fig. 12. They have the following characteristics *(42)*:

Dimensions.—Length, 25 to 200 mm.; diameter, 0.010 to 0.100 mm.

Microscopic appearance.—Under even moderately low magnification (50 ×) the epidermal scales on the surface of the fiber can be seen. Neither silk nor any of the vegetable fibers have this appearance. The scales are more or less translucent in appearance, and permit the under cortical layer to be seen through them. The medulla, commonly called the pith from its analogous structure in plant stem, can usually be seen in the coarser fibers.

Micro-chemical reactions.—Iodine-zinc chloride solution, pale yellow; HNO_3, deep yellow color; HCl or H_2SO_4, gradually dissolves with red coloration.

Blaisdell and Minor *(8)* have discussed various methods for determining the wool content of paper. They recommend the use of the microscopic dot-count method using a factor of 2.0 for wool (basis cotton = 1.0).

In view of the considerable use of artificial or synthetic fibers in textiles these may be found in some rags. Their characteristics are given by Chamot and Mason *(16)*. The effects of the various stains and of beating have not been investigated microscopically.

Determination of Percentage Composition

To check analyses of fiber composition, slides of fibers in known proportions are made. Pure stock is beaten in a small beater and made into hand sheets. Sheets of the various pure fibers are kept under the same atmospheric conditions. To make up a field of known composition take weights of the pure fiber sheets and make up a total of at least 5 grams in proportions to give the percentage desired. Disintegrate and mix thoroughly by shaking with small glass beads or pieces of glass rod in a bottle (or flask) or by the action of a small disintegrator. Sample and make up the slide as for any disintegrated paper sample.

The analysis of the fiber content is based on the relative proportion of the kind of fibers contained therein, expressed on the percentage basis, considering the total fiber content as 100 per cent. In making a fiber analysis no account is taken of the percentage of clay, alum, size, etc., that may be contained in the paper.

Spence and Krauss have pointed out *(51)* that the various fibers do not have the same weight. As shown, this introduces an error in fiber analyses done on a length or number basis. The originators of the method determined some weight factors. Weight factors have also been determined by micrometer mensuration *(23)*. Weight factors for the dot count method are being determined *(12)*. Present indications are *(37) (38)* [10] that certain compensating factors are advisable for the dot count method, but no definite weight factors have been recommended. However, one of the authors of weight factors finds that the dot count method "works very well when applying the weight factors already determined."[11]

The following methods, while not specified in the *official method*, are used by fiber analysts and yield reliable results after sufficient experience has been obtained in their use.

(a) *Estimation Method:* The estimation method involves training the eye by the comparison of unknown samples with standard mixtures of known composition. This may be done by the use of a comparison microscope or comparison eyepiece but can also be done with the usual monocular or binocular microscope. Accuracy in the estimation method requires considerable practice and continual reference to standard mixtures. In some laboratories it is customary to have several analysts estimate the same sample and then average the results. Although this method gives accurate results when used by experienced analysts, the actual counting of the fibers is considered a more practicable procedure for general use as it enables comparatively inexperienced operators to obtain satisfactory results.

(b) *Howard's Count Method (46):* In this method equal weight is not given to all fibers in a field. Recourse must be had to standard samples to determine the allowances necessary for different types of fiber and for the length of the fibers and conditions of hydration.

(c) *Fiber-Weight-Length Method:* This method was proposed by Spence and Krauss *(51)*, who used the diameter of the field as seen through the microscope as the unit of measure. Weight factors are used in calculating the percentage composition.

Graff *(23)*, on the other hand, measures the length of the fibers with a micrometer eyepiece. The fibers are arranged in parallel on the slide and their lengths determined with a micrometer eyepiece *(10) (24)*. The lengths, as determined by measurement, are corrected to a weight basis by the use of weight factors, and the composition of the paper expressed as a percentage. This method is somewhat time consuming, but is capable of very accurate results after proficiency has been obtained in measuring the fiber lengths.

3. Special Stains for Application to Papers

It is often desirable, in the plant or laboratory, to detect the presence or absence of groundwood, without especial reference to any exact percentage[12] or to the other constituents in the paper. No microscopic examination is necessary; the stain is simply applied to the paper and the color noted. The following stains are used for this purpose.

(a) *Phloroglucinol:* Dissolve 5 grams of phloroglucinol in a mixture of 125 cc. of water and 125 cc. of conc. HCl. Keep the solution in the dark as much as possible as it is prone to lose its staining property on exposure to light. This solution produces a *magenta* or *wine-red* color on mechanical pulp. The color may be easily noted by applying some of the stain to a piece of newsprint paper. There is approximately 80 per cent of mechanical pulp in newspaper so that a deep *magenta* color is developed. The depth of color is an indication of the amount of mechanical pulp present. A very light shade of color, however, does not necessarily prove the presence of mechanical pulp, as partly cooked jute, partly cooked unbleached sulphite pulp, and some other fibers are also slightly colored. In many cases jute papers show a remarkably deep coloration with this stain.[13] For strong papers of this type observations should be checked microscopically.

An additional formula is as follows:

Phloroglucine	2 grams
Alcohol (95 per cent)	100 cc.
Concentrated HCl	50 cc.

[10] Also Hardesty, N. Y. State College of Forestry, Thesis, 1933. Hill, N. Y. State College of Forestry, Thesis, 1933. TAPPI Microscopic Sub-Committee. Unpublished data.

[11] Spence, Private communication.

[12] Herzberg *(30)* gives a set of plates showing the approximate percentage of groundwood as determined with phloroglucinol. Known standards containing various percentages of groundwood may be prepared and these used as a basis of comparison for these special stains.

[13] Peterson, Private communication.

Aniline Sulphate: Dissolve 5 grams of aniline sulphate in 50 cc. of water and acidulate with 1 drop of conc. H_2SO_4. This stain produces a *yellow* color on papers containing a large percentage of mechanical pulp. It is not quite as sensitive to mechanical pulp as phloroglucinol, but is easier to obtain and prepare and costs less.

Para-nitroaniline: Saturated solution in conc. HCl. This stain produces an *orange yellow* color in the presence of mechanical pulp and other lignified fibers.

In the use of stains for application to the surface of paper it is well to caution the user on one point. Many of the dyes used for colored papers are sensitive to acids and the color change while being the correct one to show the presence of groundwood may be due not to this cause, but to the action of the acid on the dyestuff. For colored papers it is well in case of doubt to run a blank test with a little dilute acid.

4. Fiber Mensuration

The determination of the length of fibers is useful in obtaining knowledge of the pulping and beating (hydration) processes. In addition to the average length of the fibers in a sample, it is often useful to have information concerning the distribution and the weighed average length, both of which may be calculated from the length data. The widths of certain fibers have also been measured *(6) (42) (45)*.

Frequently an insufficient number of fibers are measured so that the results may be misleading. The statistics of fiber mensuration have been discussed in the literature *(11) (24) (60)*.

A number of different methods have been proposed for the measurement of the fiber length of pulps *(7) (10) (24) (36) (41) (49)*. So far no one has tried out a number of different methods on the same sample. Some one should investigate this problem.

5. Degree of Beating

By a careful examination of the fibers under the microscope it is often possible to determine, to some extent, the amount of beating (hydration) to which the stock has been subjected. The length of the fibers, the amount that the ends have been frayed and the degree of the breaking down of the cell walls (fibrilization), all give information concerning the hydration. However, it is necessary to have considerable experience before the results are reliable. The use of photomicrographs assists in this study. Kress and Bialkowsky *(35)* have published some photomicrographs showing progressive changes in structure with beating.

6. Specks or Spots in Paper[14]

The appearance of a sheet of paper may show imperfections caused by foreign materials or by malformation on the wire. These are common causes of rejection of paper and are not always wholly eliminated in sorting.

The identification of spots in paper presents a number of difficulties and frequently requires considerable experience and skill on the part of the observer. The identification of spots is chiefly of interest to the manufacturer in tracing the cause in the mill.

Occassionally spots can be identified by the use of a hand lens, but it is preferable to use a microscope. A microscope of the Greenough binocular type is somewhat easier to work with than a monobjective microscope, as the former gives an erect image and a true stereoscopic effect. It is sometimes more convenient to locate the spots by the use of the Greenough binocular, but some of the chemical tests should be carried out with a chemical microscope.

The presence of very minute specks is not objectionable in some types of papers. It is therefore convenient to make a speck count on the paper by placing representative sheets on a ground glass plate illuminated from the back. In this way the number of spots in a given area or weight can be counted, and a ring placed around each spot will serve to locate it for future identification under the microscope. In making a speck or dirt count, allowance may also be made for the size of the individual particles *(19) (50)*.

The accessories and chemicals for the identification of spots should consist, for general purposes, of a set of dissecting needles, a platinum needle (made by fusing a piece of platinum wire in a glass tube or rod and then sharpening the platinum point), a magnetized needle, carbon tetrachloride, ether, benzene, dilute hydrochloric acid, potassium ferrocyanide and an acid indicator, such as litmus or methyl orange. Unusual spots require more extensive tests in chemical microscopy.[15]

The source of many spots in pulp and paper depends, to some extent, on the type of raw material being used in the mill. Anyone doing this type of analysis should be on the watch for peculiarities, as almost any foreign material may be found. However, the general types of spots that are encountered consist of the following.

Alum Spots.—These are usually pulverized by the pressure of the calender rolls. They are soluble in water and give a slightly acid reaction with indicators. As the sulphate ion is present, due to the alum, it can be identified as described by Chamot and Mason *(17)*.

There is one type of speck caused by the alum in the stock reacting with the fresh water from the showers which does not seem to be generally recognized.[16] The material is deposited on the showers and on the wire and occasionally breaks off apparently from the showers but not from the wire. "The particles vary in color anywhere from a light brown to a green, the green, of course, being due to copper from the screens. The material is quite brittle, and under the microscope is clear and looks as if it might be crystalline. However, it shows no double refraction. It is insoluble in the organic solvents, but dissolves readily in hot dilute hydrochloric acid and gives a strong test for aluminum . . . It is probably one of the hydrates of aluminum."

Bark Specks.—These are more easily identified in wood pulp than they are in paper. The speck is easily disintegrated into brown particles by slight pressure with a needle. Due to the pressure of the rolls these spots in paper tend to be considerably broken up, but can usually be differentiated from coal or cinders by the fact that they are brown instead of black.

Bleach Scale.—"A pearly light brown colored brittle spot detected with dilute hydrochloric acid which causes effervescence giving off carbonic acid".[17]

Bronze Specks.—They may be picked up from piping, the beater, or from the press rolls. Many times they are easily identified by their shiny appearance. For some reason, apparently not fully understood, bronze specks may also occur as a dendritic growth which is characteristic and has become known as a "bronze flecke."

Bronze is identified by the red copper reaction when hydrochloric acid and potassium ferrocyanide are added to the spot. Certain types of bark specks may be confused at times with bronze from this reaction, but tend

[14] Consult also (29).

[15] Consult Chamot and Mason (17).
[16] Geohegan, Private communication.
[17] Spence, Private communication.

to have coarser particles than the precipitate formed by the above reaction.

Button Specks.—Buttons, ground by beaters or jordans into small pieces, appear in the finished sheet. These may be bone, pearl (shell), or hard rubber. The first two often make a hole due to the particle piercing the sheet and then partly crumbling out after calendering. Such specks can be differentiated from alum as they are insoluble in water and give no color reaction with indicators.

Cinders and Coal Specks.—These are insoluble and give no color reaction with any reagent. In appearance iron scale may be mistaken for these. The specks are sometimes hard and sometimes brittle, but can be easily identified by the use of a magnetic needle, as they are, of course, non-magnetic. Under the microscope it can be seen that these particles in a calendered sheet have been so pulverized by the pressure of the rolls that they shatter very easily when picked with a dissecting needle. Large particles give a characteristic black smear when crushed and rubbed across the sheet.

Color Spots.—Poorly ground colors give a fine, specky appearance usually identified only by color.

Drag Spots.—Stock adhering to the slices on the wire forms small, uneven lumps when it drags off upon the sheet. These spots are not very common but can be recognized as irregular formations having no foreign material present.

Felt Hairs.—Wool hairs from felts sometimes occur on the surface of paper. They can be identified by the characteristics previously given for wool.

Foam Spots.—Because of the depression left after each foam bubble there is a circular spot, more translucent than the rest of the sheet, formed wherever foam bursts on the partly formed sheet. The result is characteristic, the spot being circular and translucent, similar to a small, round watermark. The foam spots often contain a larger amount of filler than the part of paper around them.

Iron Specks.—Washer or beater bars, jordans, scaly pipes, corroded overhead iron work, and iron buttons from rags contribute iron in metallic or oxidized forms, at times. If the metallic particles are freed from the sheet they will be attracted by a magnetic needle.

The scale or oxidized iron can be identified (except Fe_3O_4 scale which is insoluble in HCl and must be reduced with $SnCl_2$) by adding a drop of HCl followed by a drop of $K_4Fe(CN)_6$. Iron gives a characteristic blue color.

Instead of identifying the iron under the microscope it is possible to determine which specks are Fe by immersing the paper in dil. HCl followed by dipping it in a dilute solution of $K_4Fe(CN)_6$. There will be a blue coloration wherever there is an Fe speck in the sheet (excluding, of course, the above insoluble oxide).

Knots.—In rag stock, fabrics with knotted threads very often show the knots in the finished sheet. The knotted thread is easily recognized under the microscope.

Oil Spots.—Oil spots are translucent and can be spread or thinned with ether or chloroform. Extraction with either of these solvents removes the oil, unless it is of a peculiar pasty formation caused by the use of oily rags in the stock. Mineral oil in rags is prone to form a dirty, congealed mass in the washers, which specks the half-stuff with black specks in which the mineral oil is the binder. Such specks in the finished sheet are not entirely removed by ether or chloroform. They are slightly translucent, and unaffected by solution in conc. H_2SO_4.

Paper Specks.—In stock made from old papers or where "broke" has been added, small, undefibered pieces may slide through the screens and form specks on the sheet. Such specks are fibrous and when lifted out of the sheet they can be defibered under the microscope with dissecting needles, showing their identity by this characteristic.

Resin Specks.—The source of this type of speck will be two-fold. They may come from wood pulp, the number depending on the resin content of the wood and the type of cooking. The same type of speck may also come from the incomplete saponification of rosin for sizing. They are usually translucent, amber colored specks, which may be further identified by the fact that they are soft and punky when pressed with a fairly blunt needle. They are also flattened out by this treatment, and sometimes tend to stick to the needle. Due to the type of resin or to dirt which has been picked up, they are sometimes dark colored. The dirt which is picked up sometimes consists of iron and can be identified accordingly. Resin specks are sometimes soluble in ether, but there are forms which have been so changed in the process that they are almost completely insoluble.

Rubber.—This finds its way into the stock with rag half-stock and old papers, sometimes as rubber paste in tire fabrics, rags containing elastic and the like, and sometimes in old paper stock as rubber bands from office waste.

The best characteristic for the identification of rubber is its swelling in benzine and the fact that it dissolves in carbon tetrachloride. The rubber specks will give a characteristic odor if burned by sticking them into a flame on the end of a needle.

Shives.—Shives may result from incomplete cooking or screening of wood pulp, the accidental grinding off of a beater paddle or from some similar cause. These can be identified as fibrous bundles. It is sometimes advisable to dissect them with needles. They will give a red coloration on the application of phloroglucinol.

7. Differentiation of Starches

In addition to chemical tests for the determination of starch in paper, it is possible to determine the kind of starch used. The various untreated starches have characteristic shapes and markings which may be easily identified under the microscope. This is also possible in some cases with treated starches used in tub sizes.

A large number of starches are classified botanically and methods of identification are given by Reichert *(47)* and McNair *(43)*. The starches in the above works are classified by their botanical names so that Bailey's Manual *(2)* or his larger Cyclopedia *(3)* will have to be consulted. Photomicrographs of a number of starches are given by Winton *(62)*. It is hoped that the identification of starches can be discussed later in more detail.

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New TAPPI Members

The executive committee of the Technical Association of the Pulp and Paper Industry have announced that the following have been elected to membership:

Thomas J. Bannan, vice president and manager, Western Gear Works, Seattle, Wash., is a graduate mechanical engineer from Santa Clara University and was formerly vice president of the Pacific Gear and Tool Works, San Francisco.

Harry G. Bickley, pulp mill superintendent, West Virginia Pulp and Paper Company, Williamsburg, Pa., is a 1912 graduate of Pennsylvania State College and was formerly chemist at the Tyrone mill of the same company.

Frederick H. Cherepow, student, New York State College of Forestry, Syracuse, N. Y.

Alvin H. Johnson, consulting engineer, Johnson & Wierk Inc., New York, N. Y. is a graduate mechanical engineer from Stevens Institute of Technology. He was formerly sales engineer for the Hyatt Roller Bearing Company, production manager for Lanton Auto Equipment Company and engineer for Karl A. Lefren, consulting engineering firm, New York.

Frank B. Eilers, Kalamazoo, Michigan, is manufacturers agent for the Orr Felt and Blanket Company, Eastwood-Nealley Corporation and the Fitchburg Duck Mills. He was formerly superintendent and manufacturing manager of the United Paper Board Company, Lockport, N. Y.; superintendent of the Le Ray Paper Company, Carthage, N. Y.; and engineer for the Cornell Wood Products Company.

George C. Munro, physicist, Institute of Paper Chemistry, Appleton, Wis., received his doctorate degree from California Institute of Technology in 1933.

Albert J. Smith, chemist, Miamisburg Paper Company, Miamisburg, Ohio, is a 1934 graduate of the University of Maine.

Curt Weil, engineer, Paper and Industrial Appliances Inc., New York, attended Darmstadt Technical College, Darmstadt, Germany.

Kenneth E. Youngchild, chemist and fiber analyst, Nekoosa-Edwards Paper Company, Port Edwards, Wis., is a 1934 graduate chemical engineer of the University of Wis.

Harold G. Bell, chemical engineer, West Virginia Pulp and Paper Company, Covington, Virginia, is a 1916 graduate of Pennsylvania State College.

Albert H. Bowen, research chemist, I. F. Laucks, Inc., Seattle, Wash., since 1927 attended the University of Washington.

Charles M. Koon is a graduate student at the New York State College of Forestry, Syracuse, N. Y.

W. A. Prier, is president of the Oregon Brass Works, Portland, Ore.

Robert A. Voet, chemist, United Wall Paper Factories, Inc., Chicago, Ill., attended the Universities of Illinois and Chicago.

Stark D. Wilson, construction engineer, Brown Company, Berlin, N. H., with which company he has been associated since 1912, attended Keuka College.

TAPPI and Conn. Valley Superintendents to Meet

The New England Section of the Technical Association of the Pulp and Paper Industry and the Connecticut Valley Division of the American Pulp and Paper Mill Superintendents Association will hold a joint meeting on December 8 at the Hotel Worthy, Springfield, Mass.

At 2:30 P. M. there will be a business session at which two papers will be presented.

F. W. Binns of the Virginia Smelting Company will talk on "A New Process for Decolorizing Brokefrom Specialty Runs."

H. B. Townsend of the Vultex Chemical Company will discuss "The Application of Rubber to Paper Fibers."

In the evening there will be a dinner, dance and entertainment.

Frederic C. Clark of Skinner & Sherman Inc., Boston, Mass., is chairman of the New England Section of TAPPI and Stephen G. Stapley of the Chemical Paper Manufacturing Company, is chairman of the Connecticut Valley Superintendents Association. A large attendance is expected.

Pulpwood Supplies of Georgia

The Southern Forest Experiment Station has just issued a very interesting bulletin entitled "Advance Information on the Supply of Pulpwood in Survey Unit No. 1 Georgia" by the Southern Forest Survey Staff, I. F. Eldredge, regional director. This bulletin for the first time presents actual facts instead of general statements about the supply which will, of course, be extremely welcome because of the increasing interest in the manufacture of pulp and paper in that section of the country.

The bulletin is available to interested persons and may be secured by addressing the Southern Forestry Experiment Station, United States Forest Service, New Orleans, La.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING NOVEMBER 29, 1934

CIGARETTE PAPER

Max Speigel & Sons Co., Inc., Pr. Hayes, Genoa, 35 bls.; American Tobacco Co., Paris, Havre, 10 cs.; Standard Products Corp., Paris, Havre, 33 cs.

WALL PAPER

F. J. Emmerich, Laconia, Liverpool, 1 bl.; S. K. Lonegren, Gripsholm, Gothenburg, 4 cs.

PAPER HANGINGS

W. H. S. Lloyd & Co., American Farmer, London, 2 cs., 3 bls.

NEWS PRINT

——, Hellen, Port Alfred, 573 rolls; Gilman Paper Co., Hellen, Port Alfred, 317 rolls; ——, Bergensfjord, Oslo, 631 rolls.

PRINTING PAPER

C. W. Speidel Co., Cypria, Marseilles, 5 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., American Farmer, London, 9 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., American Farmer, London, 3 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Laconia, Liverpool, 30 cs. (duplex).

TISSUE PAPER

Van Oppen & Co., Pr. Hayes, Marseilles, 7 cs.

STENCIL PAPER

Richardson Bros., Laconia, Liverpool, 2 cs.

PHOTO-PAPER

J. J. Gavin, Majestic, Southampton, 6 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Black Heron, Antwerp, 14 cs.

MISCELLANEOUS PAPER

Corn Exchange Bank Trust Co., London Maru, Osaka, 6 cs.; ——, Komaki Maru, Kobe, 29 cs.; D. C. Andrews & Co., Paris, Havre, 2 cs.; Coty Processing Co., Paris, Havre, 1 cs.; Japan Paper Co., Paris, Havre, 2 cs.; The Borregaard Co., Inc., Paris, Havre, 45 bls., 404 rolls; Blauvelt Wiley Paper Manfg. Co., Paris, Havre, 17 bls.; Kraemer & Co., Paris, Havre, 117 Bls.; E. H. Sargent & Co., Paris, Havre, 2 cs.

RAGS, BAGGING, ETC.

Leigh Textile Co., American Importer, Manchester, 47 bls. cotton waste; Royal Manfg. Co., American Importer, Manchester, 50 bls. cotton waste; J. J. Ryan & Son, American Importer, Manchester, 25 bls. cotton waste; M. Snedeker Corp., American Importer, Belfast, 166 bls. paper stock; ——, Quaker City, Leith, 90 bls. bagging; E. J. Keller Co., Inc., Quaker City, ——, 31 bls. paper stock; E. J. Keller Co., Inc., Pr. Hayes, ——, 70 bls. paper stock; J. Cohen Sons, Inc., Laconia, Liverpool, 20 bls. paper stock; ——, Norden, Antwerp, 112 bls. rags; ——, Norden, Antwerp, 124 bls. cotton waste; ——, Norden, London, 132 bls. rags; S. Birkenstein & Sons, Motomar, Barcelona, 209 bls. bagging.

OLD ROPE

A. W. Fenton, Inc., Gitano, Hull, 95 coils; Banco Coml. Italiane Trust Co., Cristobal Colon, Pasages, 346 coils; Banco Coml. Italiane Trust Co., Cristobal Colon, Coruna, 52 coils; ——, Norden, Rotterdam, 156 coils.

CHINA CLAY

——, Laconia, Liverpool, 25 casks; Orbis Products Trading Co., Laconia, Liverpool, 112 bags; C. T. Wilson Co., Laconia, Liverpool, 25 casks.

WOOD PULP

The Borregaard Co., Inc., Bergensfjord, Oslo, 622 bls. sulphate; Chemical Bank Trust Co., Bergensfjord, Oslo, 360 bls. sulphite; Irving Trust Co., Bergensfjord, Oslo, 896 bls. mechanical pulp; Perkins Goodwin & Co., Gripsholm, Gothenburg, 1,143 bls. sulphate; Price & Pierce, Ltd., Gripsholm, Gothenburg, 175 bls. sulphite, 325 bls. dry pulp; J. Andersen & Co., Gripsholm, Gothenburg, 375 bls. sulphite; Tradesmens Natl. Bank Trust Co., Gripsholm, Gothenburg, 250 bls. sulphate; Bulkley Dunton & Co., Vigor, ——, 625 bls. wood pulp; Bulkley Dunton & Co., Kaaparen, ——, 375 bls. wood pulp.

ALBANY IMPORTS

WEEK ENDING NOVEMBER 29, 1934

Halifax Pulp & Power Co., Vaga, Clarke City, 4,136 bls. ground pulp, 812 tons; Bulkley Dunton & Co., America, ——, 625 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING NOVEMBER 29, 1934

American Express Co., Quaker City, London, 62 bls. paper stock; Atkinson Haserick Co., Pr. Adams, Genoa, 2 cs. wrapping paper; G. F. Malcolm, Inc., Laconia, Liverpool, 10 cs. tissue paper; Bulkley Dunton & Co., Kaaparen,

——, 1375 bls. wood pulp; M. Sone, Haimon, Hamburg, 162 bls. wood pulp; Parsons & Whittemore, Inc., Haimon, ——, 150 bls. sulphite; Parsons & Whittemore, Inc., Tortugas, ——, 150 bls. sulphite.

PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 29, 1934

——, Quaker City, Dundee, 37 bls. paper stock; ——, Norden, Antwerp, 315 bls. rags; ——, Norden, Rotterdam, 162 bls. rags; ——, Norden, London, 115 coils old rope; Irving Trust Co., City of Flint, Hamburg, 150 bls. wood pulp; Scott Paper Co., Topeka, Bamble, 50 bls. wood pulp; Irving Trust Co., Topeka, Drammen, 1500 bls. wood pulp; Chemical Bank Trust Co., Topeka, Tofte, 500 bls. sulphite; The Borregaard Co. Inc., Topeka, Hurum, 672 bls. sulphate; J. Andersen & Co., Topeka, Hurum, 150 bls. sulphite; ——, Argosy, Hernosand, 600 bls. sulphate, 100 tons; Johaneson Wales & Sparre, Inc., Argosy, Sundsvall, 1050 bls. sulphite, 180 tons; ——, Argosy, Sundsvall, 4400 bls. sulphite, 750 tons; ——, Argosy, Sundsvall, 125 bls. chemical pulp, 25 tons; Bank of Manhattan Trust Co., Argosy, Sundsvall, 180 bls. sulphate, 30 tons; Irving Trust Co., Argosy, Sundsvall, 150 bls. sulphite, 25 tons; Bulkley Dunton & Co., Argosy, ——, 500 bls. sulphate, 100 tons; Johaneson Wales & Sparre, Inc., Argosy, Gdynia, 210 bls. wood pulp, 31 tons; M. Sone, Haimon, Helsingfors, 300 bls. wood pulp.

CHESTER IMPORTS

WEEK ENDING NOVEMBER 29, 1934

Price & Pierce, Ltd., Vaga, Clarke City, 6236 bls. ground pulp, 1221 tons.

CAMDEN IMPORTS

WEEK ENDING NOVEMBER 29, 1934

Lagerloef Trading Co., Argosy, Kemi, 5600 bls. sulphate, 935 tons; ——, Argosy, Hernosand, 600 bls. sulphate, 100 tons; ——, Argosy, Sundsvall, 600 bls. wood pulp, 100 tons; ——, by same, 6000 bls. sulphate, 1000 tons; Pagel Horton & Co. Inc., Argosy, Wallvik, 759 bls. sulphate, 125 tons; Perkins Goodwin & Co., Argosy, Gdynia, 297 bls. wood pulp, 45 tons.

BALTIMORE IMPORTS

WEEK ENDING NOVEMBER 29, 1934

Bulkley Dunton & Co., Binnendyk, ——, 1080 bls. wood pulp; M. Sone, Malaren, Helsingfors, 450 bls. wood pulp; Parsons & Whittemore, Inc., City of Norfolk, ——, 125 bls. sulphite.

NORFOLK IMPORTS

WEEK ENDING NOVEMBER 29, 1934

Irving Trust Co., Black Heron, Antwerp, 80 bls. bagging.

GALVESTON IMPORTS

WEEK ENDING NOVEMBER 29, 1934

Parsons & Whittemore, Inc., West Camak, ——, 150 bls. sulphite; Parsons & Whittemore, Inc., Uddeholms, ——, 500 bls. sulphite.

Paper Mills Directory of Great Britain

The seventy-fourth annual edition of the Paper Mills Directory of Great Britain and Ireland has just been issued by Printing-Craft Ltd., 17, Featherstone Buildings, Holborn, London, W. C. 1, England.

Perhaps the most interesting features are the entirely new sections which have been introduced this year for the first time. These include a list of London Agents for foreign paper mills, with their address, telephone, telegraphic and cable addresses, codes used, and in many cases the names of the mills represented and the grades of paper in which they specialize. As the lists of Paper Agents for British Mills, Paper Merchants in London and London Wholesale Stationers have been extensively corrected, enlarged and brought up to date, these four sections comprise a complete directory of the paper trade in London.

Other extremely useful new sections include a carefully tabulated presentation of the Import Duties on Paper and Paper Boards at present in operation as well as the Customs and Excise classification lists.

The Directory in addition to the foregoing, also contains a list of all the mills in Great Britain and Ireland, giving equipment, production, etc.

Japanese Foreign Style Paper

Japanese manufacturers of foreign style papers in 1933 experienced the most productive year in the history of their industry, according to Consul General Arthur Garrels, Tokyo. The output was 10 per cent higher than in 1932, while sealed stocks amounting to 50,000 short tons carried over from the period of depression culminating in 1931, were also disposed of. Total production of paper last year reached 722,052 short tons. Restrictions on output, which are controlled by the Paper Manufacturers' Association, were such, however, that some branches of the industry operated at only 45 per cent capacity. The total number of cylinders in operation by the members of the Association at the end of 1933 was 148 with a total of 14,653 inches, compared with 138 cylinders with a total of 13,536 inches at the end of 1932.

Swedish Kraft Market More Active

[FROM OUR NATIONAL CORRESPONDENT]

WASHINGTON, D. C., November 28, 1934—Some activity was noted in the Swedish kraft paper market at the end of August and the beginning of September, when several large sales were made to the United Kingdom and South Africa. Orders on hand at the end of the month were reported to be approximately equal to normal output. Recently some reduction in prices have been made in papers destined for the Belgian market to offset certain increases in the Belgian tariff. Similar reductions were previously made on papers sold to the Netherlands and France.

Cayuga Takes Over Waubena Mill

[FROM OUR REGULAR CORRESPONDENT]

AUBURN, N. Y., November 26, 1934—President W. E. Penny, of the Cayuga Linen and Cotton Mills, Inc., will leave tomorrow for the Cayuga Mill No. 2 at Lexington, N. C., where he will be the first week in December. This plant, formerly the Waubena Mill, has been taken over by the Cayuga concern, for the manufacture of single yarns. The machinery for other purposes will be removed to Auburn. Arthur M. Burr, Boston, is New England sales manager for twines made by the Cayuga Linen and Cotton Mills.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, November 28, 1934.

Trading in the local paper market was fairly brisk during the past week. Demand for the various standard grades of paper during the closing months of the year should be quite active. Sales forces of the leading paper organizations continue optimistic. Prices are holding to formerly quoted levels, in most instances.

The position of the newsprint paper market is improving. With few exceptions the leading manufacturers in Canada and the United States are following the example of the International Paper Company in announcing an advance in quotations for next year of $2.50 per ton for the first six months and additional $2.50 per ton for the last six months of the year.

Demand for the various standard grades of fine paper is improving and book, bond, cover and writing papers are moving in good volume. Prices are generally steady and unchanged. Tissues are going forward freely. The coarse paper market is sharing in the general improvement. The paper board market is moderately active.

Mechanical Pulp

The ground wood pulp market is slightly easier. No. 1 domestic and Canadian mechanical pulp are now quoted at from $20 to $26 per ton, f.o.b. pulp mill. No. 1 imported moist ground wood pulp is still selling at from $22 to $24; while dry is offered at from $23 to $24 per ton, on dock, Atlantic ports.

Chemical Pulp

Conditions in the chemical pulp market are fairly satisfactory. Supplies are moving into consumption at a steady pace. Prices remain unchanged. Bleached sulphite is quoted at from $2.75 to $2.85 and all prime easy bleaching at $2.25 per 100 pounds, on dock, Atlantic, Gulf and West Coast ports.

Old Rope and Bagging

The old rope market is exhibiting a strong undertone. Offerings of domestic and imported old manila rope are limited. Small mixed rope is fairly active. Old rope prices are steady. The bagging market is showing improvement. Gunny bagging is firmer. Scrap and roofing bagging are in seasonal request.

Rags

Sentiment in the domestic rag market is better. Paper mill demands for new cotton rags is more persistent. There is a brisk export request for No. 1 white shirt cuttings and fancy shirt cuttings. Roofing grades are moderately active. The position of the imported rag market is practically unchanged.

The paper board mills are beginning to show more interest in the lower grades of paper stock and the outlook for a livelier market in the near future is more promising. The recently established minimum prices on folded news and No. 1 mixed paper are well sustained. The higher grades of waste paper are fairly steady.

Steadiness prevails in the local twine market. Demand for the various varieties of twine is holding up well and should continue active during the next four weeks, at least. Prices are holding to schedule and reports of concessions are infrequent.

TAPPI MEETS AT MIDDLETOWN

(Continued from page 11)

Among those present were the following: J. J. O'Connor, Mead Corporation, Chillicothe, Ohio; O. P. Gephart, Oxford Miami Paper Company, W. Carrollton, Ohio; C. D. Roess, Wrenn Paper Company, Middletown, Ohio; R. H. Stevens, Sorg Paper Company, Middletown; J. H. Wallace, Black-Clawson Company, Hamilton, Ohio; M. L. Barker, Beckett Paper Company, Hamilton; A. D. Camp, Thomas & Hochwalt Laboratories, Dayton, Ohio; R. B. Roe, Sorg Paper Company, Middletown; R. H. G. Smith, same company; L. C. Currier, same company; C. L. Bachelder, Paper Makers Chemical Corporation, Kalamazoo, Mich.; H. E. Hadley, Gardner-Richardson Company, Middletown; Thage Dahlgren, same company; M. I. Upson, F. C. Broeman Company, Cincinnati, Ohio; K. P. Geohegan, Aetna Paper Company, Dayton; H. G. Specht, Eastwood-Neally Corporation, Belleville, N. J.; F. G. Holt, Gummed Products Company, Troy, Ohio; F. T. Bagel, same company; E. N. Bechard, Eastwood, Nealley Corporation, Belleville, N. J.; Tom Lummis, Wrenn Paper Company, Middletown; G. H. Harvey, Gardner-Richardson Company, Middletown; E. L. Puffer, Heller & Merz, New York; E. B. Taylor, Harding-Jones Company, Middletown; D. M. Borden, Miami Valley Coated Paper Company, Franklin, Ohio; D. E. Lewellen, Lewellen Manufacturing Company, Columbus, Indiana; J. F. Ohlson, Oxford Miami Paper Company, W. Carrollton; G. A. Hermann, Hermann Manufacturing Company, Lancaster; Leo Fleischer, Crystal Tissue Mills, Middletown; H. D. Frost, W. S. Tyler Company, Cleveland; John Birdsall, Crystal Tissue Mills, Middletown; E. C. Hendrickson, Mead Corporation, Chillicothe; A. J. Wildman, Beckett Paper Company, Hamilton; Val Fredrich Jr., same company; William Beckett, same company; Vincent Waters, Wrenn Paper Company, Middletown; H. H. Latimer, Beckett Paper Company, Hamilton; R. G. Macdonald, Secretary of TAPPI, New York; D. J. Monarch, Miami Valley Coated Paper Company, Franklin; Mr. Cherrie, Castle & Overton Inc., New York; John Purdy, Orr Felt and Blanket Company, Piqua, Ohio.

Japan Reduces Paper Curtailment

The Japanese paper manufacturers' association has reduced the curtailment rate on the production of certain papers to 36 per cent, commencing November 1 and extending two years, according to a recent cablegram from Commercial Attache Frank S. Williams, Tokyo.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, November 28, 1934.

BLANC FIXE.—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45 per ton, in bulk; while the powder is selling at from 3½ cents to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—Steadiness prevails in the bleaching powder market. Contracts for the forthcoming year are being booked in good volume. Prices are unchanged. Bleaching powder is quoted at from $1.90 to $2.15 per 100 pounds, in drums, at works.

CASEIN.—The casein market is fairly active. Domestic standard ground is quoted at 9½ cents and finely ground at 10½ cents per pound; while Argentine standard ground is offered at 13½ cents and finely ground at 14 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Conditions in the caustic soda market are unchanged. The contract movement is normal. Solid caustic soda is quoted at from $2.60 to $3.10; while the flake and ground are selling at from $3 to $3.05 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is marking time. Prices are holding to previously quoted levels. Imported china clay is selling at from $13.50 to $21 per ton, ship side; while domestic paper making clay is selling at from $6.50 to $12 per ton, at works.

CHLORINE.—Demand for chlorine from the paper mills is fairly persistent. Contract shipments are going forward with regularity. Prices are steady. Chlorine is quoted at from $2 to $2.40 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is fairly active. Paper making gum rosin is quoted at $4.20 and FF wood rosin at $4.30 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $2.51 per 100 pounds, in tank cars, at works.

SALT CAKE.—Contracts for 1935 are being booked in good volume at prevailing prices. Salt cake is quoted at from $12 to $14, and chrome salt cake at from $12 to $12.50 per ton, at works. Imported salt cake is selling at from $12 to $12.50 per ton, on dock.

SODA ASH.—The soda ash market is moderately active. Shipments against contract are moving freely. Prices remain unchanged. Quotations on soda ash, in car lots, at works, per 100 pounds, are still as follows: in bulk, $1.10; in bags, $1.40; and in barrels, $1.50.

STARCH.—Some improvement developed in the starch market. Demand from the paper mills is more active. Prices are holding up well. Special paper making starch is still quoted at $3.47 per 100 pounds, in bags; and at $3.74 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market is exhibiting a strong undertone. Prices remain unchanged. Commercial grades are quoted at from $1.35 to $1.50; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market continues steady. Sulphur is quoted at $18 per long ton on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market during the past week was along routine lines. Domestic talc is still quoted at from $16 to $18 per ton, in bulk, at eastern mines; while imported talc is offered at from $23 to $30 per ton, on dock.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	—
Bonds	6.00	@	—
Index	6.00	@	—
Writings—			
Extra Superfine	6.50	@	—
Superfine	6.25	@	—
Tub sized	5.75	@	—
Engine sized	5.50	@	—
Book, Cased—			
S. & S. C.	5.35	@	5.75
S. & S. C. Litho.	5.60	@	6.00
M. F.	5.10	@	5.50
Coated and Enamel	5.90	@	6.55
Coated Litho	5.90	@	6.55
Tissues—Per Ream—			
White No. 1	.82½	@	.85
White No. 2	.67½	@	—
Anti-Tarnish M. G. only	1.00	@	—
Colored	.85	@	—
Kraft	.70	@	—
Manila	.67½	@	.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	4.00	@	4.50
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.50	@	3.50
Glassine—			
Bleached	.11	@	—
Unbleached	.09	@	—

(The following Quotations are Delivered New York)

News, per ton—			
Roll, contract	40.00	@	—
Rolls, spot	40.00	@	—
Sheets	45.00	@	—
Kraft—			
No. 1 Domestic	4.75	@	5.00
No. 2 Domestic	3.87½	@	—
Southern	3.87½	@	—
Boards—per ton—			
News	40.00	@	45.00
Chip	37.50	@	40.00
Sgl. Mla. Ll. Chip	47.50	@	52.50
Jute Lined Chip	47.50	@	52.00
White Patent Coated	60.00	@	65.00
Binders Boards	67.00	@	75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	22.00	@	24.00
Dry	23.00	@	24.00
(F.o.b. Mill)			
No. 1 Domestic and Canadian	20.00	@	26.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Division 1	2.85	@	—*
Division 2	2.80	@	—*
Division 3	2.75	@	—*
Prime Qualities—			
Class 1. All Prime Easy Bleaching	2.25	@	—*
Other Than Easy Bleaching—			
Class 2. Higher Than Standard	2.20	@	—*
Class 3. Standard	2.15	@	—*
Class 4. Lower than Standard	2.10	@	—
(On Dock, Atlantic Ports)			
Kraft No. 1	1.70	@	1.80
Kraft No. 2	1.55	@	1.65
(F.o.b. Pulp Mill)			
Kraft Domestic	1.60	@	2.25
(Delivered)			
Soda Bleached	2.50	@	—

*Add 60 Cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	5.75	@	6.00
Silesias No. 1	3.75	@	4.00
New Unbleached	6.25	@	6.50
New Soft Blacks	3.00	@	3.25
Blue Overall	3.50	@	3.75
Fancy	2.50	@	2.75
Washables	1.75	@	2.00
Mixed Khaki Cuttings	3.00	@	3.25
O. D. Khaki Cuttings	3.75	@	4.00
Men's Corduroy	1.50	@	1.75
New Mixed Blacks	2.50	@	2.75

Old Rags

White, No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	@	3.25
White, No. 2—			
Repacked	1.75	@	2.25
Miscellaneous	1.50	@	1.75
Thirds and Blues—			
Repacked	1.50	@	1.75
Miscellaneous	1.25	@	1.50
Black Stockings	2.50	@	3.00
Roofing Rags—			
No. 1	1.10	@	1.25
No. 2	.80	@	.85
No. 3	.70	@	.75
No. 4	.65	@	.70
No. 5A	.60	@	.65

Foreign Rags

New Rags

New Dark Cuttings	1.60	@	1.70
New Mixed Cuttings	1.75	@	1.85
New Light Silesias	3.75	@	4.00
Light Flannelettes	3.75	@	4.00
Unbleached Cuttings	6.50	@	6.75
New White Cuttings	6.50	@	6.75
New Light Oxfords	3.25	@	3.50
New Light Prints	2.75	@	3.00

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.90	@	2.15
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	1.75	@	1.85
French Blue Linens	2.30	@	2.40
German Blue Linens	2.15	@	2.25
German Blue Cottons	1.70	@	1.80
Checks and Blues	1.30	@	1.40
Linsey Garments	1.40	@	1.60
Dark Cottons	1.00	@	1.10
Old Shopperies	.95	@	1.00
New Shopperies	.90	@	1.00
French Blues	1.70	@	1.80

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.50	@	1.60
Domestic	1.40	@	1.50
Wool Tares, light	1.20	@	1.30
Wool Tares, heavy	1.20	@	1.30
Bright Bagging	1.15	@	1.25
Manila Rope—			
Foreign	1.85	@	2.00
Domestic	1.75	@	2.00
Small Mixed Rope	1.10	@	1.35
New Burlap Cut	2.00	@	2.25
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.70	@	2.80
Ordinary Hard White No. 1	2.15	@	2.25
Hard White No. 2	1.95	@	2.05
Soft White No. 1	1.85	@	1.95
Flat Stock—			
Stitchless	.70	@	.80
Over issue Mag.	.70	@	.80
Solid Flat Book	.55	@	.60
Crumpled No. 1	.40	@	.45
Solid Book Ledger	1.50	@	1.65
Ledger Stock	1.00	@	1.10
New B. B. Chips	.30	@	.35
Manilas—			
New Env. Cut	1.70	@	1.80
New Cuttings	1.35	@	1.45
Print	Nominal		
Bogus Wrapper	.40	@	.50
Container	Nominal		
Old Kraft Machine—			
Compressed bales	1.10	@	1.20
News—			
No. 1 White News	1.20	@	1.30
Strictly Overissue	.65	@	.70
Strictly Folded	.42½	@	.50
No. 1 Mixed Paper	.32½	@	.40

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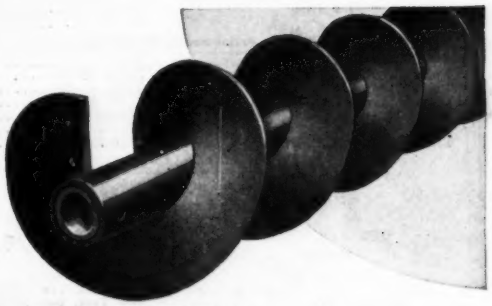

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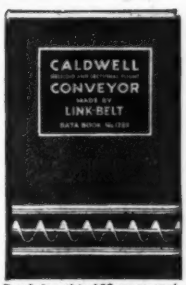

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Twines
(F. o. b. Mill)

Coarse Polished—			
India	.11¼	@	.13¾
Belg. White Hemp	.12¼	@	.15¾
India Compress	.11¼	@	.12¼
Fine Polished—			
Fine India	.16	@	.20

Special	.16	@	.18
B. C.	.25½	@	.27½
Unpolished—			
Box	.10	@	.10½
Paper Makers	.07	@	.11½
Tube Rope	.08	@	.13½
Wall Paper	.09	@	.12½
Wrapping	.12	@	.17
Special	.12	@	—
Soft Fiber Rope	.10¼	@	.10¾

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.12		.50
Water Marked Sulphite Bond	.06¾		.11
Sulphite Bond	.05½		.11
Superfine Writing	.18		.24
No. 1 M. F. Book	.06½		.07¼
No. 2 M. F. Book	.05¼		.06¾
No. 1 S. & S.C. Book	.06¼		.07¼
No. 2 S. & S.C. Book	.05¼		.06½
Coated Book	.07		.12
Coated Label	.07		.08½
No. 1 Manila	.04¼		.05¼
No. 1 Fibre	.04¼		.05¼
No. 2 Manila	.04¼		.04¾
Butcher's Manila	.03¼		.03¾
No. 1 Kraft	4.75		5.00
Southern Kraft	3.88		4.25
No. 2 Kraft	3.88		4.25
Wood Tag Boards	.04¼		.04½
Sulphite Screenings	.03		.03¾
Manila Tissue	.05¾		.07
White Tissue	.07		.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	41.00		—
Sheets, open	46.00		51.00
Boards, per ton—			
Plain Chip	46.50		—
Solid News	50.00		—
Manila Lined Chip	55.00		—
Patent coated	65.00		—
Container Lined—			
85 Test, per 1000 sq. ft.			1.70
100 Test, per 1000 sq. ft.			1.85

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.70		.80
Solid Books	.60		.70
Blanks	1.00		1.05
Krafts	.80		.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25		1.30
Ex. No. 1 Manila	.90		1.00
Print Manila	.50		.55
Overissue News	.60		.70
Old Newspapers—			
No. 1	.50		.55
Mixed Papers—			
No. 1	.30		.35
Roofing Stocks—			
No. 1	30.00		—
No. 2	28.00		—

PHILADELPHIA

Paper
(Delivered Philadelphia)

Bonds	.05-9/10	@	.38
Ledgers	.06 9/10	@	.40
Writings—			
Fine No. 3	.05	@	.06
Superfine	.10		.18
Extra Fine	.15		.24
Fine	.18		.24
Fine, No. 2	.10		.25
Book, M. F.	.05¼		.06¾
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06½	@	.09
Coated Lithograph	.06¾	@	.08½
Offset	.07		.11
No. 1 Jute Manila	6.25	@	—
Manila Sul., No. 1	5.25	@	—
Manila No. 2	3.00	@	—
No. 1 Kraft	5.00	@	—
Southern Kraft	4.75		—
Common Bogus	.03	@	.04½
News Print Rolls	46.00	@	55.00
Straw Board	40.00	@	45.00
News Board	50.00	@	—
Chip Board	45.00	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.66
Best Tarred, 3-ply	2.00	@	2.21

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.03¾	@	.04
New White, No. 2	.02½	@	.04
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01½	@	.02
Blue Overall	.03½	@	.04
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.01½	@	.03
Fancy	.01½	@	.03
New Black Soft	.02	@	.04
New Light Seconds	.01½	@	.02
New Dark Seconds	1.50	@	1.75

Khaki Cuttings—			
No. 1 O.D.	.03	@	.04
No. 2 Mixed	.03	@	.04
Corduroy	.02	@	.03
New Canvas	.03½	@	.04½
New Black Mixed	.02½	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.50
Miscellaneous	1.75	@	2.25
M. G.	3.00	@	3.75
Fairds and Blues—			
Miscellaneous	1.00	@	1.50
Repacked	1.50	@	2.00
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.85

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	1.75
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White	1.80	@	1.85
No. 2 Soft White	1.25	@	1.30
No. 1 Mixed	—	@	.75
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.00	@	1.10
No. 1 Books, heavy	.55	@	.60
No. 1 New Manila	1.35	@	1.40
Print Manila	.50	@	.60
Container Manila	.45	@	.50
Old Kraft	1.15	@	1.20
No. 1 Mixed Paper	.32½	@	—
Straw Board Chip	.30	@	—
Binders Board Chip	.30	@	—
Corrugated Board	.50	@	—
Overissue News	.60	@	—
Old Newspapers	.42½	@	—

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06		12½
Rag Content	12		30
All Rag	36		52½
Bonds—			
Sulphite	.07¼		.11
Rag Content	.12		.40
All Rag	36		.65
Writings	.06½		.20
Superfines	.11		.31
Book Paper	.06		.09
Book M. F.	.05½		.08½
Book Coated	.08½		.18
Coated Litho	.09		.12
Label	.09½		.15
Jute Manila No. 1	.11		.13
Manila, Sul. No. 1	.04¾		.06¾
Manila, Sul. No. 2	.03¾		.04½
No. 1 Kraft	.04¾	@	.05
No. 2 Kraft	.03¾	@	.04½
(F. o. b. Boston)			
Southern Kraft	03¾	@	.04½
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¾
(Delivered New England points)			
News Print, rolls	44.50		—
Straw Board, rolls	.009	—	35.00
Straw Board in Sheets, basis 35s to 70s		—	40.00
Filled News Board	40.00	@	45.00
Chip Board	37.50	@	40.00
Chip Board (Creasing)	37.50	@	40.00
Single Manila Lined Chip	47.50	@	52.50
Single White, Patent Coated News Board (Bender)	57.50	@	65.00
Wood Pulp Board	70.00	@	75.00
Binder Boards (Standard Grade)	67.00	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.00	@	2.25
No. 1 Soft White	1.75	@	2.00
No. 2 Mixed	.80	@	.85
Solid Ledger Books	1.75	@	—
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.95	@	1.05
No. 1 Books, heavy	.85	@	.90
No. 1 Books, light	.65	@	.75
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.65	@	.70
White Blank News	1.10	@	1.15
No. 1 Kraft	1.00	@	1.05
Manila	.55	@	.60
No. 1 Mixed Papers	.32½	@	—
Print Manila	.45	@	.50
Overissue News	.50	@	.55
Old Newspapers	.42½	@	.45
Box Board Chips	..	@	.25
Corrugated Boxes	.32½	@	.40
Screening Wrappers	.50	@	.60

Bagging
(F. o. b. Boston)

Manila Rope—			
Foreign	1.75	@	1.90
Domestic	1.90	@	2.00
Transmission Rope	.90	@	1.00
Mixed Strings	.17½	@	.30
Jute Rope	1.35	@	1.40
Jute Carpet Threads	.65	@	.70
Gunny No. 1—			
Foreign	1.50	@	1.60
Domestic	1.15	@	1.20
Bleachery Burlap	4.00	@	4.50
Scrap Burlap	1.05	@	1.10
Scrap Sisal	1.00	@	1.10
Scrap Sisal for Shredding	1.10	@	1.25
Wool Tares, heavy	1.25	@	1.30
New Burlap Cuttings	1.45	@	1.50
Australian Wool Pouches	2.00	@	2.25
Heavy Baling Bagging	1.40	@	1.50
Paper Mill Bagging	.90	@	1.10
Bagging No. 2	.50	@	.55

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.01¾	@	.02
New White No. 1	.05½	@	.06
New White No. 2	.03½	@	.04
Silesias No. 1	.04	@	—
New Black Silesias	.02½	@	.03
New Unbleached	.05½	@	.06
Blue Cheviot	—	@	4.65
Fancy	—		.03¼
Washable	.02¼	@	—
Cottons—According to grades—			
Blue Overalls	—		.03¾
New Black Soft	no		.04
Khaki Cuttings	.03¼	@	.03½
O. D. Khaki	.03	@	.03¼
Corduroy	.01¾	@	.04
New Canvas	—		.03
B.V.D. Cuttings	—		.03¾

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½		
White No. 1—			
Repacked	—		3.00
Miscellaneous	2.50		2.75
White No. 2—			
Repacked	2.00		2.75
Miscellaneous	2.00		2.25
Twos and Blues	1.25		1.50
Thirds and Blues			
Repacked	2.00		2.75
Miscellaneous	2.00		2.25
Black Stockings	2.25		2.50
Roofing Stock			
No. 1	.70	@	.75
No. 2	.65		.70
No. 3	.55		.60

Foreign Rags
(F. o. b. Boston)

Dark Cottons	.85		.95
New White Shirt Cuttings	5.50		6.00
Dutch Blues	2.00		2.50
New Checks & Blues	2.50		3.00
Old Fustians	1.55		1.60
Old Linsey Garments	1.25		1.35

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¼		—
No. 2 Sulphite	.08½		—
No. 1 Colored	.10¼		—
No. 2 Colored	.09		.10
Ledgers (sulphite)			
Ledgers, No. 1	.34½		—
Ledgers, No. 2	.25½		—
Writing	.09		.09½
Book—			
No. 1 M. F. (Carloads)	6.20		—
No. 3 M. F. (Carloads)	5.70		—
No. 4 M. F. (carloads)	4.75		—
No. 1 S. C. (carloads)	6.65		½ —
No. 3 S. C. (carloads)	6.20	@	—
No. 4 S. C. (carloads)	5.20	@	—
No. 1 Coated and Litho	12.00		—
No. 2 Coated and Litho	10.50		—
No. 3 Coated and Litho	9.50		—
Coated tinted	14.00		—
Wrapping—			
Rag Brown	4.25		—
White Wrap	2.22½		—
"B" Manila	4.75		—
No. 1 Manila	5.25		—
Fiber	5.25		—
Kraft, M. F.	5.75		—
Kraft No. 2	5.25		—

(F.O.B. Cars Toronto)

News per ton—			
Rolls (contract)	39.50		—
Sheets	44.50		—

Pulp
(F. o. b. Mill)

Ground Wood	18.00		20.00
Sulphite easy bleaching	40.00		—
Sulphite, news grade	38.00		—
Sulphite, bleached	50.00		55.00
Sulphate	50.00		—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00		2.30
Soft White	1.60		1.90
White Blk. News	1.25		1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90		1.00
Light and Crumpled Book Stock	.80		.90
Ledgers and Writings	1.00		1.05
Manilas—			
New Manila Cut	1.25		1.50
Printed Manilas	.70		.60
Kraft	1.25		1.50
News and Scrap—			
Strictly Overissue	.80		—
Strictly Folded	.60		—
No. 1 Mixed Paper	.50		—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06		.06¼
Fancy Shirt Cuttings	.02¼		.02½

BENNETT

TRADE MARK

ROSIN-WAX SIZE

EFFICIENCY

Wax when properly combined with rosin will lower its melting point. Thus Bennett Rosin-Wax Sizes have greater covering power than rosin size at a given drying temperature, and when fluxed will spread over three times as much area as rosin size. This combined with the fact that wax increases the difference in surface tension between water and the fibres to a greater extent than rosin, accounts for the increased sizing efficiency of Bennett Rosin-Wax Sizes.

Increase in sizing efficiency means:

1. That less Bennett Rosin-Wax Size is required than rosin size to secure a given degree of sizing. In many cases the amount of size can be reduced from 35% to 50%.

2. A greater sizing resistance can be obtained with Bennett Rosin-Wax Size than it is possible to secure with rosin size. This is of particular advantage in water-proof specialties.

(This is one of a series of advertisements dealing with the profitable application of Bennett Rosin-Wax Sizes. Additional information regarding the subjects discussed will be furnished on request.)

BENNETT INCORPORATED

CAMBRIDGE, MASS., U. S. A.

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SIXTY-THIRD YEAR

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